November 1, 1940

VOLUME 103 NUMBER 2

A Bill Brothers Publication

INDIA RUBBER WORLD

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Published monthly by Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y. Chairman of Board and Treasurer, Raymond Bill; President and General Manager, Edward Lyman Bill; Vice Presidents, Randolph Brown, B. Brittain Wilson.

A BILL BROTHERS PUBLICATION

Subscription price—United States $3.00 per year; Mexico $3.50; all other countries $4.00. Single copies thirty-five cents. Other Bill publications are *Premium Practice, Rug Profits, Sales Management, Soda Fountain, Grocer-Graphic,* and *Tires.*

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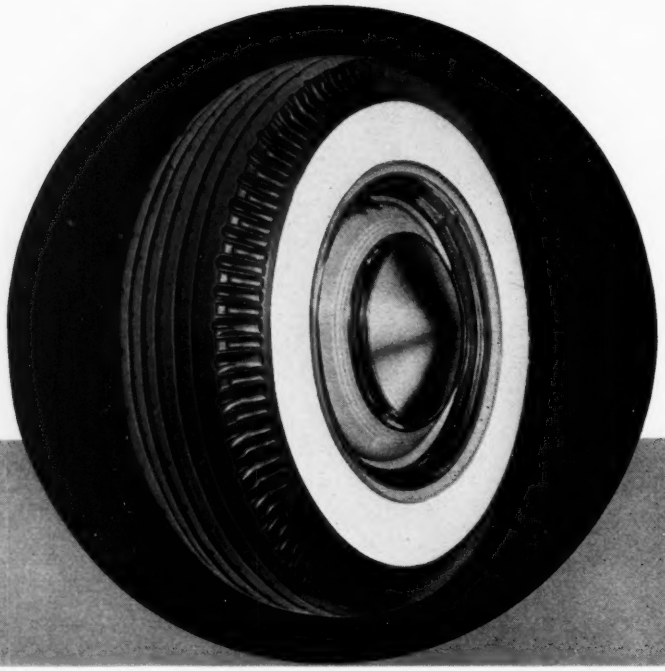

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INDIA RUBBER WORLD

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Volume 103 **New York, November 1, 1940** **Number 2**

Vice President of the Firestone Tire & Rubber Co., Akron, O.

The American Way

Harvey S. Firestone, Jr.

IT IS well for us frequently to inventory and appraise the progress and the accomplishments which have been realized during the comparatively short life of this country and then to evaluate the practices and conditions which have made possible such rapid strides in the advancement of our national and individual life. The spirit of rugged individualism and the theory of reward commensurate with creative effectiveness through free enterprise have been vital factors during the periods of pioneering this new land and the development of its resources. The results already accomplished appear as indisputable evidence of the soundness of the principles which have been followed and justify a continuation of the struggle to preserve those principles as a guide in our future endeavors.

This brief review of some of the benefits of and the factors contributing to our national advancement has been abstracted from a talk on the subject "New Processes, New Products and the Consumer" given by Mr. Firestone at the Boston Conference on Distribution, Luncheon Session, October 7, 1940. EDITOR'S NOTE.

In recent months we have added to the wealth of our vocabulary a very significant phrase, "The American Way." The power of the press, the radio, and the stage have combined to fix this phrase firmly in our minds as descriptive of the political and social philosophies which underlie our form of government. But it is even more comprehensive than this. "The American Way" includes also the American concept of free enterprise and competition. It is every bit as descriptive of our industrial and commercial methods as it is of our principles of government.

In the relatively short period of 154 years the United States has become the most desirable nation in the world in which to live. During that time the American standard of living has increased fourfold. Today more than 66% of our national income is disbursed in wages and salaries as compared with only 38% in 1850. In the United States it takes only 60 hours of average wages to buy a radio as compared with 135 hours in Germany and 333 hours in Italy. One hour's wage in this country will buy 7½ pounds of bread as compared with 2½ pounds in Germany, 2¾ pounds in Italy, and less than 2 pounds in Russia.

No other country on earth has such a high per capita wealth as the United States, and in no other nation does the average citizen possess as many of the comforts and conveniences of life as the average American. 59% of all American homes are equipped with running water. 89% are wired for electrical current. 51% have telephone service. The typical American family owns an automobile, a radio, a washing machine, a vacuum cleaner, and a gas or electric cooking stove.

Many of us can vividly remember when most of these products were first introduced to the public. You will recall that all of them were once considered luxuries and sold at such high prices that their benefits could be enjoyed only by a few. Today, thanks to American manufacturing ingenuity, they are no longer regarded as luxuries but rather as necessities.

To industry, "The American Way" means bringing to people in every walk of life the benefits of its new developments. Industrial research in the United States follows two well-defined and parallel paths—the first leading toward the development of new products and the improvement of existing products—the second, toward the development of new processes and the improvement of existing processes.

We have in the field of transportation a concrete example of these two phases of industrial progress. During the early part of the Twentieth Century the auto-

mobile began replacing the horse and buggy as a means of personal transportation. Thus a new product contributed to the comfort of Mankind. But these first motor cars sold for as much as $3,000 each, and, naturally, only a few people could afford them. Soon, however, engineers found ways of reducing manufacturing costs through the use of machinery and by standardization and volume production. Thus new processes brought the automobile within the reach of the average American.

The automobile industry also furnishes an outstanding example of increased employment through the introduction of new products and new processes. The greatest number of people ever employed in connection with horse-drawn vehicles in the United States was approximately one million. Today more than 6½ million people owe their living directly or indirectly to the automobile industry. In other words, the new industry has supplied 550% more jobs than the old industry which it replaced. That is a good point to remember the next time someone tells you that modern mechanization and manufacturing efficiency is the cause of unemployment. As a matter of fact, there are more people engaged in making machines today than were employed in all branches of manufacturing a century ago.

It has been truly said that industry can never stand still. It must continue to advance or be hopelessly left behind by the swift tempo of modern life. Not only has American industry introduced thousands of new products, which benefit Man, and developed many new processes, which put these products within the reach of people in every walk of life, but it has also worked unceasingly to improve the quality of existing products. Again, the automobile industry is typical. Not long ago, in a small town in Montana, several automobiles of 1907 model were discovered in a warehouse. None of them had ever been driven. Mechanically, they were as good as the day they left the factory. The original price tag on these old-new automobiles was $3,000 each, and yet at public auction they sold for only $25 apiece. Such is the swift course of progress. The automobile which you buy today did not exist at any price 25 years ago. Men simply had not learned how to build so good a car in those days.

A similar record of progress has been made by the tire industry. In 1913 a first-quality tire for a popular make of motor car retailed at $22.80 and averaged 35 hundred miles of service. Today a first-quality tire for the same make of car sells for $14.05 and averages 25 thousand miles. Therefore a tire buyer today pays only one dollar for the same amount of tire service that would have cost him more than $12 less than 30 years ago.

In every major industry the story is much the same: a relentless search for new processes and new products. And it is the consumer who benefits as evidenced by the fact that retail prices during the past 10 years have decreased nearly 25%, while industrial raw material prices have decreased only 18%, and hourly wage rates have actually increased 22% during this same period.

The urge to invent is as old as the human race and exists today in every normal man, woman, and child. But only occasionally does Mankind discover some law or invent some thing which quickens the progress of civilization. A man responsible for such an achievement enters the ranks of the immortals. Typical of these great gifts are the principle of the lever, by Archimedes; the law of gravity by Newton; the steam engine by Watt; the cotton gin by Whitney; the steamboat by Fulton; the telegraph by Morse; the telephone by Bell; and the electric light by Edison. The contribution to human welfare of such men is beyond comprehension. Mankind is immeasurably wealthier in many ways because they lived. Through their genius and sacrifice the burdens upon humanity have been lightened and life has been made infinitely richer. They are truly the pioneers of progress. And today there are men now living whose names will be added to this honor roll in years to come and their work will become an enduring and priceless heritage of future generations.

The achievements of these modern pioneers may result in the creation of entirely new industries. Certainly their accomplishments will alter the present pattern of many industries just as the invention of the incandescent lamp by Thomas Alva Edison revolutionized the petroleum industry at the beginning of the Twentieth Century. You may recall that kerosene for illumination was at one time the chief product of petroleum. Here in America our great oil industry attained its initial growth by marketing "coal oil" throughout the world. Shortly after Edison's discovery, electrical illumination spread throughout the land, and in millions of American homes the kerosene lamp was blown out forever. In consequence, many predicted the end of the petroleum industry as an important factor in our national economy. But Destiny had other plans. Before the kerosene lamp was relegated to obscurity, the development of the automobile opened up a new market for petroleum which soon eclipsed its former importance as a source of light.

Quite often Science has found the way to expand the uses of an established product by applying it in new fields. A case in point occurred in our own industry when, eight years ago my father, who was born and raised on a farm and always maintained a deep interest in farm problems, developed the first practical pneumatic tractor tire and put the farm on rubber. Since then, pneumatic tires have brought many advantages to the farmer, making his work easier, saving him 25% in fuel and 33% in time and extending the use of his equipment to many more tasks. As a result, 90% of all farm tractors manufactured this year will go out on rubber.

The development of many new products is made possible by the physical properties of certain materials. Again I cite our own industry as an example. Taking advantage of its cushioning property, its silencing effect and its water-proofing ability, we have developed thousands of new uses for rubber. In the modern motor car alone there are now more than 300 rubber parts exclusive of tires and tubes. Thread made from latex, the milk-like product of the rubber tree, is now widely used in the textile industry particularly in bathing suits, foundation garments, and other articles where snug fit is required. In recent years methods have been developed for aerating liquid rubber latex. It is then baked and molded into a wide range of articles for the seating and mattress industries. These and many other similar examples illustrate how new products and new processes have made important contributions to the comfort and convenience of the human race.

In the past few months the attention of all America has turned to the problems of national defense, one of which is the acquisition of strategic raw materials. Events abroad have swept into the discard many previous conceptions of military strategy and tactics. Speed is the very essence of modern warfare. And the realization of this significant fact emphasizes again the vital importance of rubber, the material that makes such speed possible.

Napoleon once remarked that an army marches on its stomach. Had this great Corsican lived to see the last World War and witnessed troops moving toward the battle lines in motor trucks, he might have said, "An army marches on rubber." And today we know that it not only marches on rubber, but fights on rubber, as well.

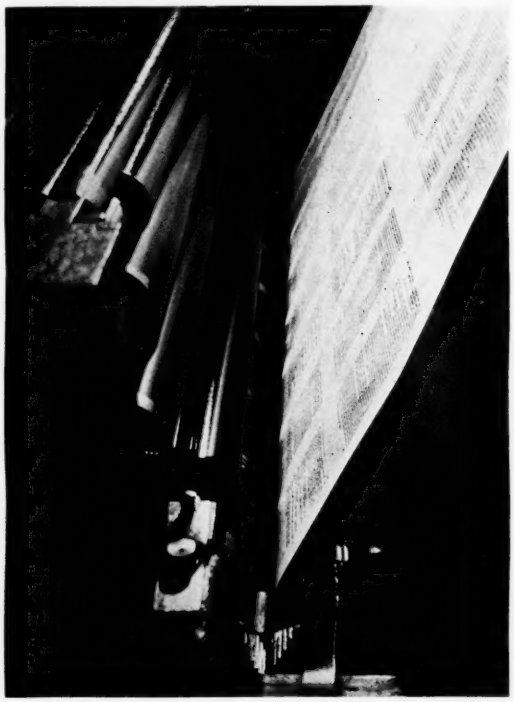
The army tank, once a cumbersome, unwieldy vehicle which waddled along no faster than a man could walk, now races along on its rubber track blocks at 50 miles an

(*Continued on page* 44)

Rubber Plates Enter Book Printing Field

THE use of rubber printing plates is not a new development. Engraved or hand-cut rubber plates and thick, somewhat crude molded rubber plates made from clay matrices have been used for many years in the graphic arts. Only in recent years have rubber plates molded from plastic matrices come into use. Up to the present, application in this field has been limited chiefly to specialty work—printing on corrugated boxes, cellophane, fabric and paper bagging, and envelopes; and for continuous design and general commercial work.

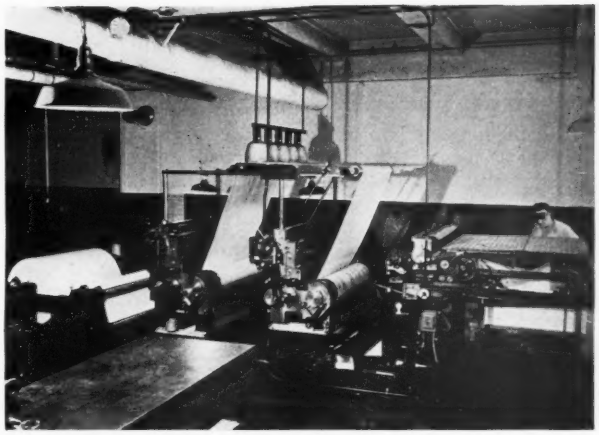
Until recently presses used for rubber plates have been, for the most part, standard rotary-type presses rebuilt for this purpose. While these presses do good work, they have limitations in the high-speed work necessary for long-run book production.



Close-Up of Printing Operation Showing Printed Paper Web and Rubber Plates on Press Cylinder

Book Printing Development

Several years ago a program of experimental and development work, aimed at bringing rubber plates into the highly competitive book publishing field, was initiated by S. E. May, of Econo Products, Inc., Rochester, N. Y., and collaborated in by American Type Founders, Inc., Elizabeth, N. J., The B. F. Goodrich Co., Akron, O., and the North River Press, 311 W. 43rd St., New York, N. Y. From this work a high-speed, web-fed, rotary press for printing books entirely from rubber plates was developed. The first press of this type, built by the Webendorfer Division of American Type Founders, Inc., was installed at the North River Press last May. Currently the Press is being used to print a first edition of 210,000 copies of the November Book-of-the-Month Club



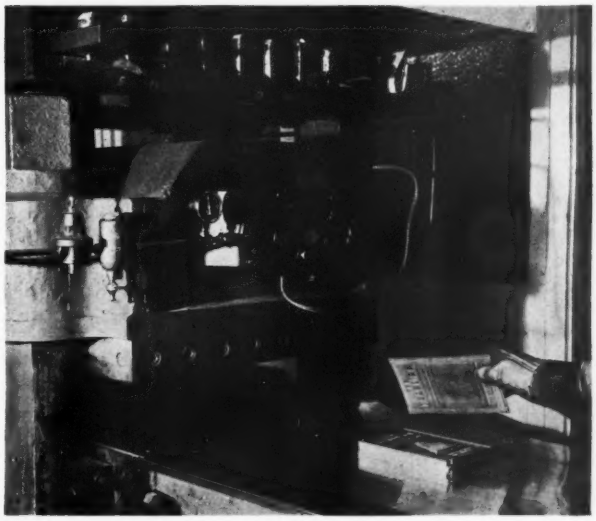
Webendorfer Press Developed Especially for Book Printing with Rubber Plates

selection. "For Whom the Bell Tolls," by Ernest Hemingway. Previously a special popular edition of "The Yearling" was printed on the new press. In addition to the new press, special rubber compounds for plates and plastic compositions for matrices were developed.

This new development in printing technique has been described as an advance comparable to the invention of the linotype and the rotary press, and its initial success assures the future of rubber in the book printing field.

The Webendorfer Press

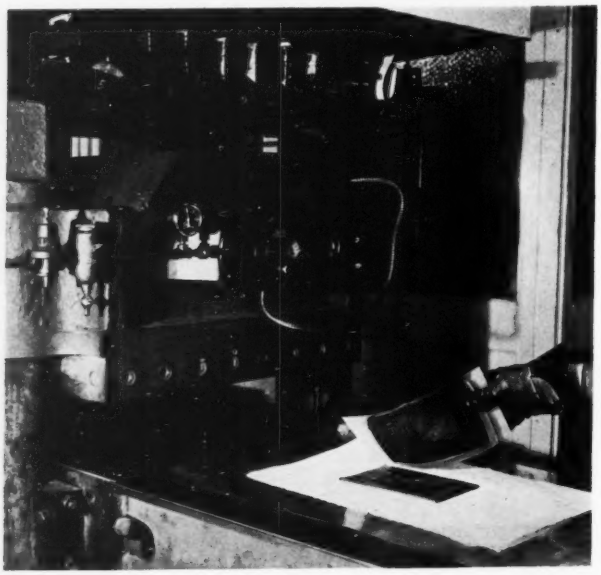
The new press carries a roll of paper up to 45½ inches in width; while the impression cylinders are 34⅛ inches in circumference. The press consists of two printing units and is capable of printing 32 pages of standard book size on both sides of the paper web at one operation. With a production speed of about 7,000 impressions per hour, the



Removing Plastic Matrix from Type Form after Molding and Curing

press can print close to one-half a million pages in an hours' time, which is about three times the capacity of the flat-bed perfecting type of printing press ordinarily used in book printing. Despite this increased production capacity, the new press is much smaller in size than the perfecting type of press. This reduction in the massiveness of the press is due largely to the reduced pressure requirements for impressions. While metal plates require about 1,500 pounds per square inch of pressure, rubber plates need only 50 pounds of pressure per square inch.

The feeding mechanism of the press is designed so as to keep the paper under constant, even tension at all times to insure the light "kiss impression" necessary with rubber plates. Both strength of impression and paper feeding should be closely controlled to avoid plate abrasion. Dust is also a factor in plate abrasion, especially with antique finished papers; therefore, dust control is important. The web of paper passes through one rubber plate printing unit, where one side is printed, and is carried over rollers for 12 feet before entering the second unit for printing the other side. To assure sufficient drying of the ink and thus avoid setoff or smudging, the web passes under a bank of infra-red drying lamps located above the paper and between printing units.



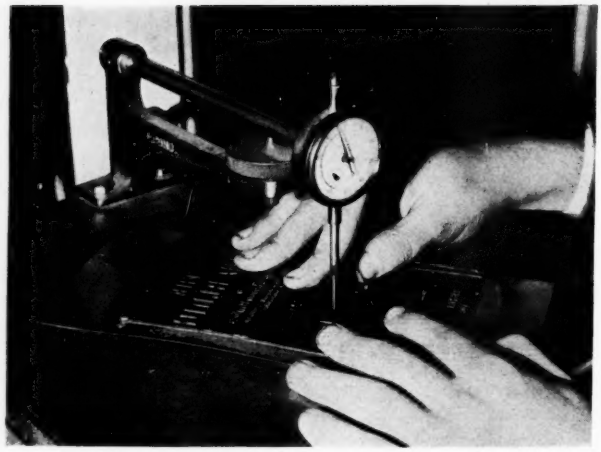
Removing Rubber Plate from Plastic Matrix after Molding and Vulcanizing

As the web leaves the second printing unit, it is automatically trimmed to exact size by rotating knives which operate on both edges of the paper. The frayed and soiled edges thus removed are disposed of by means of an air blast. The press delivers the web into a positive chain delivery unit where the printed sheets are cut to exact dimensions, an operation which greatly facilitates the subsequent work of the bindery.

Rubber Plate Production

While the plates used in the new process are made in much the same way as are other molded rubber plates for printing, there are certain refinements in materials and technique. The plate-making process used by the North River Press is described below.

Rubber plates are made from any type, electrotypes, line engravings, and especially prepared halftones. From the original metal type a mold or matrix is prepared, which in turn is used for molding the rubber plate. In



Testing Rubber Plate for Uniformity of Gage

this transformation from type to matrix to rubber plate, none of the original detail is lost. The matrix is made from a thermosetting plastic sheet material, Plastiply, which was developed by Econo, and the plates utilize a special printing rubber compound developed by Goodrich to meet the service specifications of the process. In both the production of the matrix and the rubber plate, a 24- by 32-inch steamheated platen press is used with a platen temperature of 307° F.

The linotype or other type, together with cuts, are set up in page form, with the cuts mounted on metal. A wood backing will result in unevenness in the matrix impression. Over this type is placed a ⅛-inch thick sheet of Plastiply covered with a thin sheet of metal to prevent adherence of the plastic to the press platen. When the assembly is in place in the press, the platens are brought together until there is a space of about ⅛-inch between the plastic and the top platen. In this position a preheat is carried out for 1½ minutes to soften the plastic before the impression is made. After the preheat the press is closed, forcing the type into the plastic to form the matrix. The matrix is cured for 10 minutes under a platen pressure of 500 pounds per square inch at a temperature of 307° F. In this process as well as in the molding of the rubber plates, it is important that the alinement of the press platens be held to close tolerances. From a single matrix as many as 20 rubber plates can be made if necessary. The matrices are filed away for use if duplication is necessary, as in the case of reprintings of books in popular demand.

The rubber sheet used for the plates is ⅛-inch thick, is internally reenforced with a sheet of fabric, and

Steps in Rubber Plate Production: ***Top, Left to Right:*** **Thermosetting Plastic before Molding and Curing; Printing Plate Rubber before Molding and Vulcanizing; Spring Brass Sheet for Backing Rubber Plate.** ***Bottom, Left to Right:*** **Type Form; Molded Plastic Matrix Reproduced from Type Form; Rubber Plate Molded from Plastic Matrix; Book Showing Page Printed from Rubber Plate**

has a tacky backing preserved in storage with Holland cloth. The rubber sheet with the tacky surface up is placed on top of the matrix, and a 0.010-inch thick sheet of spring brass cut to proper dimensions, is placed on the tacky surface of the rubber. This assembly is placed in the press with a thin sheet of metal between the lower platen and the matrix to prevent adherence of the plastic and a sheet of Holland cloth between the upper platen and the sheet of spring brass to prevent mold overflow from contacting the platen. The press is then closed, and the cure held for five minutes at 307° F. In the curing process the rubber plate becomes firmly vulcanized to the spring brass forming an integral unit. The fabric reenforcement and brass backing reduce the natural tendency of rubber to shrink.

Accuracy of gage is of primary importance in obtaining best results with rubber plates. With careful molding technique and the use of precision hydraulic press equipment, a set of plates can be made with gage variations of not over 0.003-inch.

Plate Attachment and Ink Requirements

The rubber plates with the spring brass backing are readily adjusted to the curved shape of the impression cylinder to which they are affixed by means of a special patented device incorporated with the cylinders. With this patented base, together with the accessibility of the impression cylinders, complete plate changes and make-ready are accomplished in about one-third the time required in the case of usual metal-plate book printing.

The choice of proper ink is of importance in rubber plate work. No material which would dissolve the rubber or cause it to swell may be included in the ink. Of course plates made from synthetic rubbers are not subject to the same limitation. In addition, with the high press speeds used, the ink must be fast drying. Leading ink manufacturers are in a position to supply inks for use with rubber plates, in which mineral and resin varnishes, as well as certain driers, have been omitted or reduced to a minimum. The use of rubber plates results in a saving of about 25% in the amount of ink consumed.

Advantages of New Process

The principal advantages of rubber plates, which are generally applicable to the new process for book printing, are: less make-ready time, less ink consumption; softer, easier-to-read impression; less wear on printing presses; higher printing speeds; and better conformity to irregular surfaces. Speed of plate manufacture and inexpensive plate storage are other considerations in this type of work. Also a smaller press, much lighter in weight and requiring less power for operation, can be used with rubber plates for book printing without sacrifice of production capacity.

While the North River Press specializes in book production, the new rubber-plate equipment and press can be used for combination runs of letter heads and forms, for all-over print jobs such as fancy wrapping papers, greeting cards, etc.

New York Auto Show Indicates Advanced Engineering Use of Rubber

IN ADDITION to the 18 makes of 1941 model passenger cars shown eight makes of light commercial vehicles were on display at the Forty-first National Automobile Show at the Grand Central Palace, New York, N. Y., from October 12 to October 20, inclusive. For the first time in many years the Ford Motor Co. exhibited at the show.

While there are no radical innovations in rubber usage in the new models, sufficient evidence was on hand to demonstrate its wider acceptance as an automotive engineering material. Changes in design of rubber parts indicate a better understanding of the engineering properties of rubber. Seat cushions from latex foam, introduced two years ago, are in wider use.

The 1941 Ford utilizes a two-piece rubber insulator for body bolts. One piece is a stepped cylinder, and the other is a rubber ring. The body support stamping is clamped between these two parts, with a metal bushing on the bolt to prevent excessive compression of the rubber.

In the Oldsmobile the up-and-down movement of the gear shift arm in the steering-wheel gear-shift assembly is cushioned by a built-in rubber bumper. Molded rubber protects the hinge point of the assembly. Also in this car, rubber cushions in the rear bracket support the thrust member.

Softer rubber shims are used on the Buick as body mountings, with spacers that limit compression. The new Willys Americar is also said to utilize a new-type rubber support for mounting the body. The rear spring action of the Cadillac is said to have been improved by the use of an auxiliary rubber bumper that prevents bottoming insulated rear spring shackles are now used in the Plymouth, and synthetic rubber oil seals have been applied to the rear axle shaft. Rubber boots, which are now coming into more general use for enclosing and protecting working parts, are applied over the Plymouth's universal drive. The steering gear and pitman arms of the Packard are rubber insulated; while the Nash is equipped with rubber mounted alinement bars, extending from rear axle to torque tube, to provide lateral cushioning.

An innovation in tire rims, exclusive with Chrysler-made cars this year, enables the driver to maintain control over his car if a blowout occurs at speeds up to about 60 miles per hour. A small ridge or hump forms a depression where the tire bead is seated on the rim. This hump prevents the bead from sliding down into the well of the rim when a blowout occurs, and the deflated tire is said to behave as if under 10 pounds' per square inch air pressure.

1939 Producers of Synthetic Rubber

P. W. Barker, of the Leather and Rubber Division of the United States' Department of Commerce, in his recent pamphlet, "Rubber: History, Production, and Manufacture,"[1] reveals that for 1939 the total world production of synthetic rubber is estimated at 75,000 long tons, against 1,005,000 long tons of natural rubber. Leading producers of the synthetics follow, in long tons: U. S. S. R., 50,000; Germany, 20,000; United States, 3,000; others (United Kingdom, Italy, Japan, and Poland), 2,000.

[1]See India Rubber World, Oct. 1, 1940, p. 72.

The Para Rubber Trade 90 Years Ago

OF HISTORICAL interest is a memorandum written by Richard M. Everit on December 15, 1892, in New Haven, Conn., at the request of Henry L. Hotchkiss, who became connected with L. Candee & Co., New Haven, Conn., in 1863, one of the founders of the United States Rubber Co. and a director until he retired in 1929. This memorandum which was recently called to our attention by H. Stuart Hotchkiss, son of Henry L. Hotchkiss and now president of the Cambridge Rubber Co., lists four importers of India rubber in 1850 and deals with the conditions existing in the 1850's during which time the firm of Hotchkiss Brothers became active as importers of Para rubber from South America. Russell Hotchkiss, the founder of the firm R. Hotchkiss & Sons, which in 1842 became Hotchkiss Brothers, was an uncle to Henry Hotchkiss, a partner of L. Candee, and the granduncle of Henry L. Hotchkiss. Because of the connection with the family which for three generations has been active in rubber manufacturing and because it pertains to the early importation of crude rubber into this country, the following memorandum is reproduced in its entirety.

There were on Long Wharf, in New Haven, many years ago a number of houses engaged in the West India trade. Among them was the firm of R. Hotchkiss & Sons, which, after the death in 1842 of Russell Hotchkiss, became Hotchkiss Brothers, the members being, Russell, Henry O., and Edward Hotchkiss, sons of the founder of the house. On my becoming a partner in the firm in 1854 the name was changed to Hotchkiss Brothers & Co., and it remained so until 1860, when I withdrew and went into business in New York City.

The Hotchkiss firm was led to engage in the Para rubber trade in this manner: In 1850 there were but four importers of India rubber in the country, John Bertram and Thomas P. Pingree, of Salem, Mass., and H. K. Corning and James Bishop & Co., of New York. The price here for India rubber had been increased from time to time from 25 or 30¢ per pound until in that year 50¢ was demanded and paid for it. This price the manufacturers considered too high, and they seemed to think that the importers were imposing upon them. This was no doubt the way that L. Candee & Co. felt, and being located in New Haven, they went to the Messrs. Hotchkiss and talked over the matter with the idea and hope of getting them to engage in the business and so bring India rubber to this port, where, and in the near-by towns, it was then used.

Previous to the year 1850 I had spent from seven to ten months in each of seven years in the West Indies and so had become acclimated and familiar with the ways of living and of doing business in hot climates. The Messrs. Hotchkiss came to me, and as I was favorably impressed with the project, and willing to join them in it, it was arranged that I should take passage in some vessel bound to Para, take some money and letters of credit with me, and see what, if anything, could be done in the way of establishing a profitable business there. At this time it was rather difficult to get a passage to Para, particularly for any one suspected of wanting to go there for business purposes, and so applications were usually declined. James Bishop & Co., however, promised to give me a passage in their barque *Republic*, to sail about October 15, 1850, but when this time came, they wrote me that the yellow fever was prevailing there to an alarming extent and advised me not to think of going out then. This advice I followed, and perhaps it was well that I did so, for I found out afterwards that more than four thousand persons, or nearly one-quarter of the whole previous population, died during the year.

After some months we heard that this fever was abating, and in March, 1851, we chartered a small centerboard schooner of 98 tons register, and 700 or 800 barrels capacity, called the *H. S. Lanfair*, and loaded her with flour and other things, and I embarked on her for a country where I knew no one and where no one had ever heard of me. I had, however, two letters of introduction that proved to be good ones. I was 38 days in getting to Maranham, where we touched first and landed a part of the cargo. I then proceeded to Para, where the balance of the cargo was discharged, and the vessel reloaded with nuts and other products, including 50,000 or 60,000 pounds of rubber. For this last I paid 17 milreis per arroba of 32 pounds (it was then sold by the arroba and for many years after), exchange being 31½d., or nearly twice what the rate now is. The price paid for this rubber was the same as others had paid for several months and was much more than had ever been paid before for this article. The vessel had a quick passage home of 18 days, and the rubber she brought was mostly sold at 50¢ per pound to L. Candee & Co.; a little going to another party at 52¢.

As this our first trial gave a little profit, my partners sent the vessel back to me, soon after following it up with a second and larger one, and so continued to keep one or two vessels running for 17 months, during which time the price here for rubber was continually declining, until it got down, if I remember rightly, to 30¢ or even less. It declined also in Para, so that what I at first paid 17 milreis for, I bought for 10 milreis, but as it was, we had not found the business profitable so far, and my partners recalled me. When I reached home, however, I told them that I had been recalled at the wrong time, and as it then seemed so to them, we very soon bought a fine little brig called the *Mary Emily*, and soon after bought another vessel called the *G. Spear*, and so kept these two vessels in the trade most of the time until 1860. I then left this firm and joined C. P. Burdett in New York when the firm of Burdett & Everit was formed, which firm, and their successors, Burdett & Pond, as is well known, built up a large business and became among the largest importers of Para rubber in the country. The Messrs. Hotchkiss continued two or three years after I left them, when, their agents in Para having died, they gave up the rubber business and devoted their time to the West India trade.

In 1851 and 1852, when I was there, Para was a small place of 12,000 or 14,000 people, with not a dozen Americans in the whole province, and, like the business, was then very small compared with what both are today. The first steamer on the river commenced running while I was there, to Barra, on the Rio Negro, which place as I understand, is now a large town of 30,000 to 40,000 inhabitants called Manoas, and is visited by foreign vessels and numerous steamers. When I was there, all the products of the country were transported to Para in curiously constructed covered boats, some of which were six or eight months in making a trip down and up the river. It is true the uses for rubber were very small then, for as late I think, as 1853 or 1854, the shoe companies by agreement among themselves, one year made altogether but 1,200,000 pairs of shoes. Now the whole equatorial

(*Continued on page* 46)

Standardization in the Field of Mechanical Packing[1]

F. C. Thorn[2]

IN 1938 there was organized under the chairmanship of William Staniar, E. I. du Pont de Nemours & Co., Inc., a subcommittee of A.S.T.M. Committee D-11 on Rubber Products entitled Subcommittee VI on Packings, Gaskets and Pump Valves. The membership of this subcommittee comprises representatives of companies manufacturing and using mechanical packing. Its agreed-upon program is to work toward correcting the admittedly unsatisfactory situation existing, because of lack of standardization, in the field of test methods for packing, and purchase specifications based thereon.

The first steps in such a program are to agree upon definitions of terms, limit the scope of the program, and survey existing conditions within the allotted scope. Appropriate sections were accordingly set up. In the field of nomenclature a surprising degree of confusion was found to exist. For its own guidance the subcommittee accepted at its recent meeting in Detroit, the following set of definitions:

A Packing (singular) is a non-rigid article designed for inclusion in the wall of a fluid container to prevent or minimize leakage between the rigid parts of such container.

Packing (collective) is an aggregate of individual packings, or material in sheet, coil, or bulk form from which packings may be prepared.

A Gasket is a packing for insertion between parts of a fluid container in essentially stationary relationship.

Gasketing is material in sheet, coil, or bulk form from which gaskets may be prepared.

A Valve Disk is a specialized gasket designed to constitute the working face of a rigid valve and to improve its tightness when closed.

A Diaphragm (in the packing sense) is a specialized packing designed for inclusion between parts of a fluid container in limited relative motion, and designed to absorb this motion by its own deformation.

Diaphragm sheet is sheet from which diaphragms may be cut.

Regarding scope, it was agreed that the work would be limited to packings containing rubber, or a rubber-like plastic, as a major ingredient. This is a natural consequence of the position of the subcommittee within Committee D-11 on Rubber Products. A tentative classification of such packings was proposed, as follows:

	Forms Recommended for Subcommittee Action
I.—*Gaskets* (Including sheet or strip from which gaskets are intended to be cut):	
A. Rubber compounds without fabric reenforcement or a high percentage of fiber	Rubber sheet
B. Rubber compounds with a high percentage of fiber	Compressed asbestos sheet
C. Rubber compounds with fabric reenforcement	
(1) Cotton fabric	
(*a*) Sheet (or strip cut from sheet),	Cotton insertion sheet
(*b*) Rolled or folded strip, and	
(c) Gaskets prepared from preceding forms with or without subsequent molding	
(2) Asbestos fabric	
(*a*) Sheet (or strip cut from sheet),	Asbestos insertion sheet
(*b*) Rolled or folded strip, and	
(c) Gaskets prepared from preceding forms with or without subsequent molding	Boiler gaskets
(3) Wire fabric (sheet only)	Wire insertion sheet
D. Rubber compounds with reenforcement of twisted or braided asbestos yarns	

[1] Reprinted from *ASTM Bulletin*, May, 1940, pp. 17-18.

[2] Secretary, Subcommittee VI on Packings, Gaskets and Pump Valves, Committee D-11 on Rubber Products; chief chemist, Garlock Packing Co., Palmyra, N. Y.

Table I. Specification Requirements

Purchaser	Specific Gravity	Chemical Requirements	Hardness	Tensile Strength, Psi.	Elongation, %	Set: After Stretching, %	Set: Max., %	Aging: Days	Aging: Oven Temperature ° F.	Aging: Maximum Decline %: Tensile Strength	Aging: Maximum Decline %: Elongation	Special Tests
Railroad—A	1.70 to 2.38	"Salmon color"	.....	650 min.	200 min.	...	...	...	...	...	...	3 days in steam at 307 F. (between flanges)
B	.....	.....	.....	.....	100 min.	...	...	...	...	...	...	1 hr. in air at 300 F.; also a compression test
C	1.74 to 2.09	Ash—65 to 75%	.....	450 min.	125 to 250 min.	...	...	...	...	...	...	6 hr. in air at 212 F.
D	.....	.....	.....	900 min.	250 min.	...	...	7	158	25	...	7 hr. in air at 300 F. (between flanges); also 48 hr. in 45 lb. steam; also swelling test in cold water
E	.....	"Red antimony rubber or equivalent"	.....	700 min.	200 min.	200	38	...	...	...	...	1 hr. in air at 250 F.; also compression test
F	.....	.....	.....	500 min.	.....	...	...	...	...	...	...	.....
G	1.39 to 2.09	.....	.....	400 min.	75 min.	...	...	...	...	...	...	6 hr. in air at 300 F.
Municipality	.....	.....	.....	500 min.	150 min.	...	...	...	...	...	...	1 hr. in air at 260 F.
Industrial—A	2.04 max.	Non-blooming	.....	750 max.	200 min.	150	20	4	158	25	25	.....
B	1.75 to 1.80	Red	80 to 85*	900 min., Length 800 min., Cross	.....	...	...	7	158	10	...	.....
Federal†	175 max.	Rubber by vol., 60% min.	.....	1000 min.	350 min.	300	25	4	158	25	...	4 hr. in steam at 366 F. (between flanges)

* Shore Durometer.

† The Federal Specification and possibly some of the others have undergone changes since the date of this survey, but the changes have not been in the direction of greater uniformity.

II.—*Valve Disks:*	
A. Rubber compounds without fabric reenforcement or high percentage of fiber	Pump valves and disks for globe valves
B. Rubber compounds with a high percentage of fiber	Disks for globe valves
C. Rubber compounds with fabric reenforcement	
III.—*Sliding Contact Packings* (including sheet or strip from which rings, etc., are intended to be cut):	
A. Rubber compounds without fabric reenforcement or high percentage of fiber	
B. Rubber compounds with high percentage of fiber	Rubber-bonded plastics (doubtful)
C. Rubber compounds with fabric reenforcement	
(1) Cotton fabric	
(*a*) Sheet (or strip cut from sheet),	"Low pressure" spiral hydraulic coil
(*b*) Rolled or folded strip, and	Round piston packing
(*c*) Rings (or other forms) prepared from preceding forms with or without subsequent molding	
(2) Asbestos fabric	
(*a*) Sheet (or strip cut from sheet),	
(*b*) Rolled or folded strip, and	"High pressure" spiral
(*c*) Rings (or other forms) prepared from preceding forms with or without subsequent molding	
D. Rubber compounds reenforced with twisted or braided yarns, wires or metal foil strips	Rubber bonded asbestos valve stem packing; rubber bonded metal foil constructions (doubtful)
IV.—*Diaphragms* (including sheet from which diaphragms are intended to be cut):	
A. Rubber compounds without fabric reenforcement	
B. Rubber compounds with fabric reenforcement	
(1) Cotton fabric	
(*a*) Sheet (or strip cut from sheet),	Diaphragm sheet
(*b*) Diaphragms molded from preceding	
(2) Asbestos fabric	
(*a*) Sheet (or strip cut from sheet),	
(*b*) Diaphragms molded from preceding	

It was also agreed that attention should be confined to those rubber packings which are used in general plant maintenance, which are purchased by practically all industries, railroads, and municipalities, and which are shown in the last column above. Specialty packings, such as purchased by the Navy, by automobile, airplane and other equipment manufacturers are considered, for the immediate future, to be outside of the scope of the subcommittee as now constituted.

A special section on Survey addressed a questionnaire to federal departments, and, in addition, to 119 railroads, steamship lines, municipalities, and industrial firms requesting information as to their practices in purchasing packings of the types indicated. Of 53 replies received from other than federal departments, only 15, or 12.6% of those addressed, employ any specifications at all, and very few of these have specifications covering more than a few of the enumerated items. Where it was possible to secure an expression of opinion regarding specification purchasing of packings, the reaction was somewhat spotty, some firms being apparently satisfied with the results obtained, others uncertain, and still others definitely of the opinion that specification purchasing did not lead to any benefits commensurate with the time and trouble entailed.

As illustrating the state of confusion prevalent in the field, comparisons were made in parallel columns, of specifications applicable to single items. Thus, in the field of ordinary sheet rubber gasketing, we find the specifications shown in Table 1 in effect.

We find the specifications to be completely divergent in respect to:

(*a*) The kind of tests to be employed.
(*b*) The manner of applying them, and
(*c*) The minimum (or maximum) values demanded.

In fact there is such a divergence that the uninitiated reader would hardly be expected to know that all these companies are trying to purchase the same product; that is, a sheet rubber gasketing for ordinary flange service against water, air, and (possibly) low-pressure steam. It is hardly necessary to point out that this situation adds to the cost of producing sheet rubber packing, both with respect to the diversity of products which must be produced and the cost of conducting the tests themselves. It is also hardly necessary to point out that this added cost is eventually borne by the purchaser.

Similar situations, which it is unnecessary to summarize here, were found to exist among the specifications applicable to (*a*) compressed asbestos sheet, (*b*) cotton inserted sheet, (*c*) asbestos inserted sheet, (*d*) folded boiler gaskets, and (*e*) wire inserted sheet. In the fields of pump valves, valve disks, diaphragm sheet, duck-rubber spiral, asbestos-rubber spiral, specifications were too few to permit extended comparison, but it is apparent that the writing of specifications in respect to these products also is in a very unsatisfactory state.

The section working on the above survey has concluded that the fundamental difficulty with writing specifications is that nobody knows what correlation, if any, exists between the various laboratory tests and service. The first duty of the subcommittee will be to determine what existing laboratory tests can be shown to correlate with service, and to concentrate on these to the exclusion of all others. The second will be to simplify and standardize these tests so that reproducible values can be obtained as between different laboratories. The third will be to develop new tests which will be equally simple and reproducible and perhaps correlate even closer with service than any of the existing tests. The question of limiting values to be assigned—that is, the actual promulgation of material specifications—is properly postponed until the end of the program.

An effort is now being made to organize special sections, each dealing with a particular type of packing. The subcommittee will be glad to hear from any engineers who may have ideas or suggestions respecting any specifications and test methods for packing.

New Green Pigment

Utility Green is the name given to a new green pigment made in variety of shades by Utility Color Co., Inc., 377-99 Frelinghuysen Ave., Newark, N. J. The pigment is claimed to be inert and permanent and to offer excellent dispersion qualities and tinctorial strength. Also it is said to have no apparent effect on the rate of cure.

German Patents Relating to Synthetic Rubber-like Materials—VII

Law Voge[1]

IN MARCH, 1933, Dr. Mueller-Cunradi assigned another patent application[2] to I. G. Farbenindustrie, A.G., Frankfurt, on a "Process for the Preparation of Synthetic Materials." The claim covers subjecting 1-chlor-butadiene-1.3 to polymerization in the absence of oxygen or in the presence of limited amounts of oxygen. Eight examples are presented; in the first, 1-chlor-butadiene-1.3 is sealed in a vessel that is evacuated and then heated to 30° C. for 19½ hours. A water-clear polymerizate is obtained in a yield of 46%. By adding 1% by weight of aldol-alpha-naphthylamine it can be rolled to a sheet of excellent strength. The non-transformed 1-chlor-butadiene can be recovered by vacuum distillation. Other reagents suggested are benzoyl peroxide, metallic sodium, methyl heptane, sodium oleate, magnesium oleate, oleic acid, and methyl-isopropenyl-ketone.

In May, 1934, the United States Rubber Co., New York, N. Y., made application[3] for German patent on a "Process for the Preparation of Mixtures of Plastic Polymers of Chlor-2-Butadiene-1.3." As this is not a German invention, it requires no further description.

An important patent application,[4] entitled "A Process for the Preparation of a Mixture of Synthetic Rubber Resistant to Benzine and Oil," was applied for in December, 1933, by Dr. P. Stoecklin and associates and assigned to the I.G. The granting of this patent required fully six years of consideration, and, incidentally, it is the next to the last synthetic rubber patent of Germany issued to date; consequently it is translated in its entirety:

"According to German patent 658,172, mixed polymerizates are prepared by emulsion polymerization, in common, of butadiene, its homologs and analogs on the one hand, and on the other hand of unsaturated nitriles of the general formula $H_2C{:}CR{\cdot}C{:}N$, wherein R is hydrogen or alkyl. The vulcanizates obtainable from these mixed polymerizates by ordinary means are characterized by excellent mechanical properties, especially through an exceptionally high resistance to frictional wear. A further valuable property of these substances is evident in that they and their vulcanizates possess a resistance to swelling with respect to organic solvents, such as benzine, oils, etc., which exceeds that of the best natural rubber vulcanizates.

"It has been found that the fine swelling-resistance of these vulcanizates can be still further improved in that the unvulcanized mixed polymerizate is commingled with a certain percentage of the plastic sulphurous *condensation products* according to patent 675,401. These latter are obtained from low-molecular, aliphatic alcohols or ethers, which contain at least two halogen atoms attached to different carbon atoms, or where the ether group presents an ethylene oxide formation, contain at least one halogen atom. They are obtained by transformation with alkali, ammonium or alkaline earth polysulphides.

"The addition of these condensation products, signifies for the mixed polymerizate an increase in the plasticity and thereby an appreciable improvement in the workability. Furthermore, the already inherently high-swelling-resistance of the polymerization products with respect to benzine and oil is considerably increased.

"Dependent on the requirements made on the rubber article to be manufactured of strength and elasticity on the one hand, and of swelling-resistivity on the other, the amount added of the plastic condensation product can be varied. Good results can be obtained, for instance, if the condensation product is used in amounts of 10 to 70% of the total weight of the mixture.

"The introduction of the plastic mass can be accomplished in the most varied manner. For instance the mixed polymerizate can be homogeneously rolled with the plastic product and then the fillers be added or the finished mixtures of the two components can be combined. It is also possible to introduce into a finished mixture of the mixed polymerizate, the necessary quantity of plastic condensation product without further addition of fillers.

"Or the procedure can be, to mix emulsions of the two components together and to bring the mixture to coagulation in appropriate manner. Naturally there may also be combined mixtures of condensation products with the mixed polymerizate.

"The vulcanizates obtainable by the present process, besides having excellent swelling-resistance, are characterized also by fine physical properties (tensile strength, extensibility and resiliency. Identical or even similar effects are not obtainable by combination of natural rubber with the above-mentioned plastic masses.

"*Example* 1. 130 parts by weight of a butadiene-acrylic acid nitrile mixed polymerizate from 75 parts by weight of butadiene and 25 parts by weight of acrylic nitrile are mixed with 70 parts by weight of a soft condensation product, obtained from interaction of epichlorhydrine and sodium polysulphide.

"With the mixture of 130 parts by weight of butadiene-acrylic acid nitrile mixed polymerizate, 70 parts by weight of condensation product, 50 parts by weight of red iron oxide, 20 parts by weight of activated zinc oxide, one part by weight of stearic acid, two parts by weight of sulphur, one part by weight of mercaptobenzothiazol, there is obtained after a heating of 60 minutes at three atmospheres above atmospheric, vulcanizate with the fine properties of soft rubber characterized by excellent swelling-resistance.

"*Example* 2. 100 parts by weight of a butadiene-acrylic acid nitrile mixed polymerizate are rolled together with 30 parts by weight of a condensation product of β-β′-dichlorethyl-ether with sodium tetrasulphide and 70 parts by weight of another condensation product from glycerine dichlorhydrine and sodium tetrasulphide. There is obtained a tough plastic mass that can be well rolled and drawn out to smooth sheets.

"From the mixture of 100 parts by weight of butadiene-acrylic acid nitrile mixed polymerizate, 100 parts by weight of condensation products, 50 parts by weight of gas black, 10 parts by weight of activated zinc oxide, one part by weight of stearic acid, two parts by weight of sulphur, one part by weight of mercaptobenzothiazol, there is obtained on heating for 50 minutes at three atmospheres above atmospheric, vulcanizates of good strength and resiliency. In benzine for some days, the increase in weight was less than 2%.

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[1] Research chemist and engineer, Washington, D. C.
[2] No. 608,681 granted Jan. 29, 1935.
[3] No. 651,762; Oct. 19, 1937; U. S. application, Oct. 18, 1933.
[4] No. 684,936, Dec. 8, 1939.

"*Example* 3. 100 parts by weight of a mixed polymerizate of butadiene and acrylic acid nitrile are intimately rolled together with 50 parts by weight of a condensation product formed from glycerine dichlorhydrine and sodium tetrasulphide, and 50 parts by weight of a condensation product from β-β'-dichlorethyl ether with sodium tetrasulphide. There is obtained a plastic adherent mixture of excellent workability. If this mixture is vulcanized as in Example 2, then vulcanizates are obtained of especially good elasticity and swelling-resistance.

"Patent-claim: Process for the preparation of a mixture of synthetic rubber proof against benzine and oil, characterized in that a mixed polymerizate according to patent 658,172 is mixed with a plastic condensation product according to patent 675,401 and the resultant mixture vulcanized."

Dr. L. von Zuetphen assigned to the I.G. in May, 1934, an application[5] covering a "Process for the Preparation of Polymerization Products." In his introduction the inventor states:

"As initial materials for the preparation of synthetic rubber products there have been used to date, exclusively, hydrocarbons and their derivatives which are based on the butadiene structure without the molecule having other unsaturated valencies (that is, butadiene-1.3, isoprene, dimethylbutadiene, 2-chlor-butadiene-1.3). It has now been found that the unsaturated chloridized hydrocarbons with long chains produced by attaching hydrochloric acid on vinyl butadiene acetylene,[6] that is, a butadiene with unsaturated side chain containing a four-carbon atom and a chlorine tetramer of acetylene of yet unknown composition can become readily polymerized, especially under the action of light, to rubbery products. They are more workable than the butadiene polymers and are more elastic and therefore roll better."

The claim follows: Hydrochloric acid linked to vinyl butadiene acetylene in the presence of concentrated hydrochloric acid and small amounts of cuprous chloride and ammonium chloride and the compound obtained polymerized by known methods.

In the example given, vinyl butadiene acetylene, to which advantageously is added hydroquinone or pyrogallol, is introduced, with the exclusion of oxidizing substances (for instance, in a nitrogen atmosphere) into an actively stirred solution of concentrated hydrochloric acid with small catalytically active amounts of cuprous chloride and ammonium chloride at room temperature. After a short time the combination with the hydrochloric acid has occurred. The oil layer is separated off and washed with water. The chlorine tetramer of acetylene formed is rectified by distillation in a hydrogen atmosphere in vacuum of two millimeters pressure at 50 to 60° C. By light, heat, or polymerization accelerators the rubbery polymerizate is produced.

A "Process for the Stabilization of Polymerization Products of Halogeneous Butadienes" formed the subject of patent application[7] in June, 1934, of Drs. Konrad and Meyer assigned to the I.G. This is a supplement to patent 611,380. The inventors state that polymerized products of halogenated butadiene are often not durable as they release continuously small amounts of halogen hydrogen compounds. If they are heated to 100° C. in a solid or powdered form or in dissolved or swollen state in a high boiling point inert solvent, e.g., toluene or xylene, by the blueing of Congo paper a gradual splitting off of hydrogen-halogen is observed. This property limits their use. The present invention stabilizes them. The claim states: "Change in the process of patent 611,380 for stabilizing chlorination products of high-molecular substances characterized in that in place of chlorine products of high-molecular substances, here polymerization products of halogenous butadiene are exposed at elevated temperature to the action of material which contains ethyleneoxide groups." In the example given, in a solution of 15 parts by weight of a polymerization of 2-chlor-butadiene-1.3 in 85 parts by weight of xylene, 0.4-part by weight of para-chlorphenoxy-propene oxide is stirred. This solution is heated "for a considerable time" at 100° C. without splitting off HCl; while in an untreated solution much HCl is produced. 2-brom-butadiene-1.3 acts similarly.

In October, 1934, Dr. Heubaum assigned to the I.G. application for patent[8] on a "Process for Polymerizing Chlor-2-Butadiene-1.3 in Aqueous Emulsion." The inventor states that synthetic rubbers from 2-chlor-butadiene-1.3 with properties like natural rubber (e.g., soluble in rubber solvents) were only possibly obtained previously by hot polymerization. The application of emulsion polymerization to it was not successful. The claim of the present invention then continues: "A process for the polymerization of chlor-2-butadiene-1.3 in aqueous emulsion characterized in that the emulsion polymerization is carried out in the presence of small amounts of neutral alkali or ammonium salts."

Example 1. Fifty grams of 2-chlor-butadiene-1.3 are dissolved in 50 cubic centimeters of 2% sodium oleate solution containing one gram of ammonium sulphate. This is emulsified and allowed to stand at room temperature. After two days the product is 40% polymerized, is soluble in benzene, and is plastic. Other salts suggested for use are sodium thiosulphate, potassium iodide, potassium iodate, instead of ammonium sulphate.

In December, 1935, United States Rubber Co. again applied for German patent[9] on a "Process for the Preparation of Mixtures of Polymeric Chlor-2-Butadiene-1.3." As an American invention, this requires no detailing here.

A patent[10] was applied for in March, 1935, by Dr. O. Nicodemus and his associates and assigned to the I.G. on a "Process for the Preparation of Polymerization Products from Halogen-4-Butadiene-1.2." The inventors preface their claims with a statement that it had been known that iodo-4-butadiene-1.2 could be polymerized. It is precisely these iodine compounds which are characterized in organic chemistry by an exceptional role of great reactivity. It was consequently not to be foreseen that other halogen-4-butadiene-1.2 compounds could be polymerized, as chlor-4-butadiene-1.2 had so far not been found to be polymerizable. The inventor finds that it can be made so if the polymerization is carried out under the action of light, heat, or catalysts with or without gaseous pressure. Dependent on the working conditions employed, either lowly or highly polymerized compounds can be formed. The two claims follow: (1) Subjecting chlor-4-butadiene-1.2 to polymerization under the action of light, heat, or catalysts, optionally under pressure. (2) Polymerization held down to a definite degree by the use of polymerization retarders.

Example 1, chlor-4-butadiene-1.2 is boiled for 48 hours in a reflux condenser with exclusion of air. The non-transformed chlor-4-butadiene-1.2 is distilled off, and the residue distilled in vacuum of 95 to 100° C. and 10 millimeters mercury pressure. Colorless terpene-like smelling material distills over: Chlormethylallene ($C_8H_{10}Cl_2$),[11] a self-drying oil. Other examples are given.

Dr. Karl Hamann assigned to the I.G. in April, 1935, an application[12] covering a "Process for the Polymeriza-

(*Continued on page* 46)

[5] No. 657,945, Mar. 17, 1938.
[6] *J. Am. Chem. Soc.*, 53, 4199, 4201 (1931).
[7] No. 642,562, Mar. 8, 1937.
[8] No. 645,201, May 24, 1937.
[9] No. 674,774, Apr. 21, 1939; U. S. application, Dec. 22, 1934.
[10] No. 664,458, Aug. 27, 1938.
[11] Allene is the same as propadiene.
[12] No. 672,928, Mar. 13, 1939.

Exposure Tests of Stretched Vulcanized Sheets from Milled Rubber and from Latex[1]

W. J. Potter[2]

THE deterioration of ruber, known as "atmospheric cracking," has always been an important factor in the aging of rubber articles. Investigations have conclusively proved that this action appears when the rubber is under tension and that variations in the tension produce either more or less cracking. It is very interesting to note that, when the exposure time is short, the greatest decrease in tensile strength due to "atmospheric cracking" is obtained at the lower elongations, in the vicinity of 5 to 25%; whereas the tensile strength at the higher elongations is nearly as high as the unstretched samples.

Kelley, Taylor, and Jones[3] show this phenomenon, but indicate that after being exposed for much longer periods of time, the samples exposed at the higher elongations deteriorate much faster than those at lower elongations. They state that "this is probably due to the fact that when the samples under greater tension began to crack, the cracks opened wide, exposing fresh surfaces to bright light, whereas the cracks in samples under weak tension were not pulled wide open and the fresh surfaces at the bottom of the cracks were shadowed from direct sunlight."

Haushalter[4] showed that deterioration of rubber can be produced in a very short time if it is exposed to ozone in a stretched condition. Williams[5] determined experimentally that ozone is necessary to obtain "atmospheric cracking" by chemically proving its presence near his exposure samples. He also proved that while oxygen is necessary, sunlight directly on the sample is not. Evidently the action of the sun's ultra-violet rays generates ozonized air which attacks the rubber. Somerville *et al*[6] showed that there is a very definite similarity between aging stretched rubber in sunlight and ozone. Their data indicate a very definite "critical elongation"—between 5 and 10%—for rubber exposed in the aforementioned ways.

In another article Haushalter, Jones and Schade[7] maintain that maximum cracking in sunlight and in ozone seems to occur more nearly at a definite tension than at a definite elongation. They found that unstretched rubber showed no deterioration after many hours in ozone.

Finally Kearsley[8] suggests that the film produced by the action of ozone on the surface rubber has very little extensibility with the result that a slight tension will be sufficient to cause cracking. The stress on the rubber will open the cracks only slightly, thus allowing the ozone to penetrate into them and attack a limited area. On the other hand, at high elongations, the cracks are opened wide, thus exposing greater surface areas to be attacked. Apparently this fact would explain the formation of cracks over the entire surface of rubber at high elongations.

It is the purpose of the investigations of this paper to compare the effects of continuously exposing stretched latex and milled rubber for 24 hours per day for seven days in the open air, for seven days in air in the absence of sunlight, and in ozone. While the latex industry is still in its infancy, there has been considerable increase in the use of latex in recent years, and information on its reactions to various types of exposure would perhaps suggest changes in the art of compounding. As far as the author can determine, a comparison of this nature has never been published.

Preparation of Specimens

In this work it was deemed suitable to compare a typical latex compound and its milled rubber analog, with a typical milled rubber compound and its latex analog.

TABLE 1

	L-1	PC-1	L-2	PC-2
Rubber*	100	..	100	..
Pale Crepe	..	100	..	100
Zinc Oxide	1	1	1	1
Sulphur	1	1	2.5	2.5
Zinc Diethyl Dithiocarbamate	1	1	0.25	0.25

*Rubber as 60% latex.
The other ingredients were added to the latex in a water dispersion.

The latex compounds were poured on glass plates, 4 by 24 inches, allowed to dry in air for 30 hours, placed in a vacuum drier for 16 hours, and cured in hot air at 220° F. The rubber compounds were mixed on a small laboratory mill and cured in a press at 220° F. For purposes of comparison, the same range of cures was used for all of these compounds. The optimum cure was selected as most suitable for testing purposes.

TABLE 2. TENSILE PROPERTIES

Stress at 500% (S)—Tensile Strength (T)—% Elongation (E)

	L-1			PC-1			L-2			PC-2		
Cure at 220° F.*	S	T	E	S	T	E	S	T	E	S	T	E
15 Minutes	230	4630	925	200	3050	890	170	4025	995	160	2300	990
30 Minutes	315	4875	910	240	3400	840	230	4100	960	195	3120	930
45 Minutes	310	4650	920	240	3400	885	280	4050	985	230	3370	875
60 Minutes	315	4780	920	225	3325	890	275	3900	985	330	3510	850

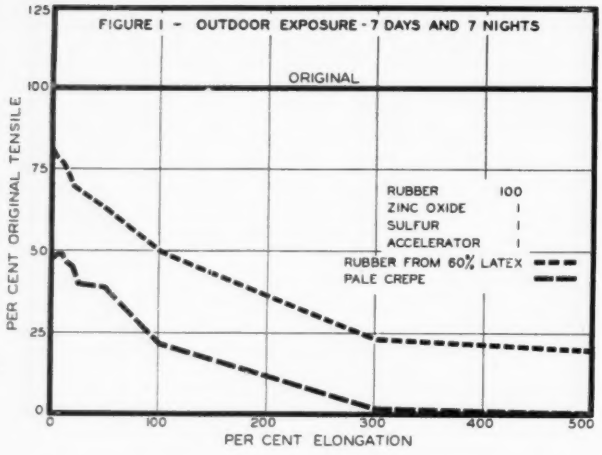
*Hot air cures for L-1 and L-2; press cures for PC-1 and PC-2.
Optimum cures selected were 30 minutes at 220° F. for compounds L-1 and PC-1; 45 minutes for compounds L-2 and PC-2.

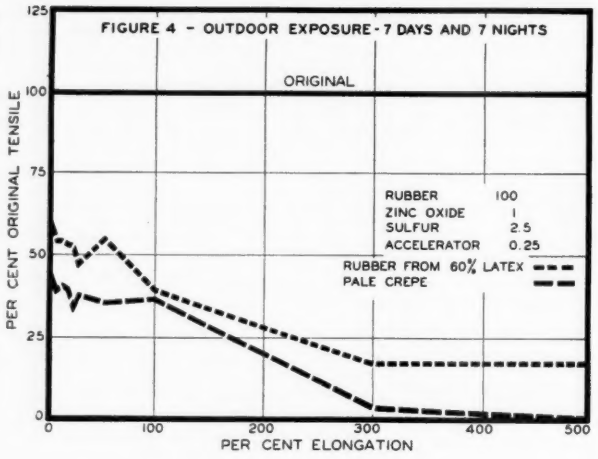
Conditions of Exposure

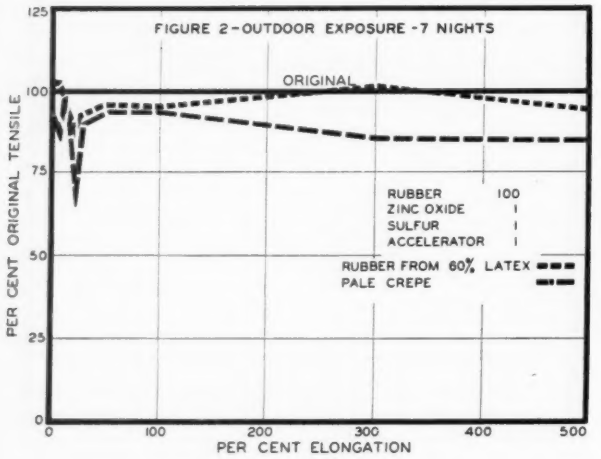
The cured slabs were approximately 0.040-inch in thickness and were translucent. Dumbbell-shaped pieces, which were cut from the films with a ⅛-inch die, were tacked to suitable boards at elongations of 0, 5, 10, 15, 20, 25, 50, 100, 300, and 500%. Duplicate sets of specimens were made; one set was exposed continuously during early July at a 45° angle, facing south, where it received considerable direct sunlight (this set will be subsequently designated as the "sun exposure" samples); and the other set was exposed near the first set only at night, and during the day removed to a comparatively cool, shaded place in the laboratory where there was only diffused daylight (this set will be designated as the "air exposure" samples). After seven days and seven nights of exposure, the dumbbells were removed from the boards, and their tensile strengths were determined.

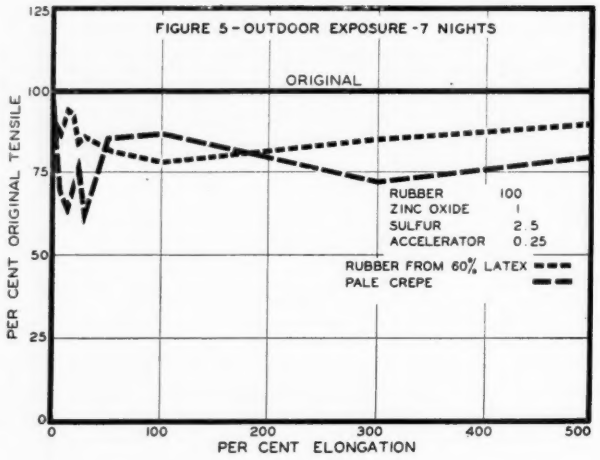
A third set of samples was exposed for 15 minutes to the action of ozone, in a chamber where the concentration was 0.015%. The samples were clamped in a special rack which could be adjusted to any desired elongation. After exposure at the same elongations as the other two sets, the samples were allowed to stand overnight before being released and tested.

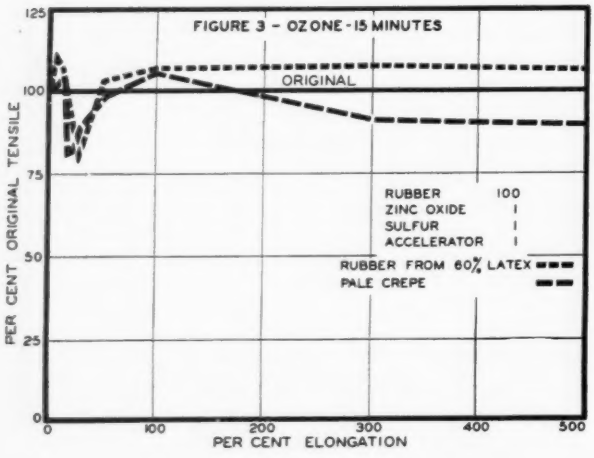
[1] Presented before the New York Group, Division of Rubber Chemistry, A. C. S., Oct. 18, 1940, as winner of second prize in the 1940 Essay Contest sponsored by the New York Group.
[2] R. T. Vanderbilt Co., East Norwalk, Conn.
[3] *Ind. Eng. Chem.*, 20, 296 (1928).
[4] *Elec. World*, 86, 267-69 (1925).
[5] *Ind. Eng. Chem.*, 18, 367 (1928).
[6] *Ibid.*, 21, 1183 (1929).
[7] *Ibid.*, 20, 300 (1928).
[8] *Rubber Age (N. Y.)*, 27, 12, 649-52 (1930).

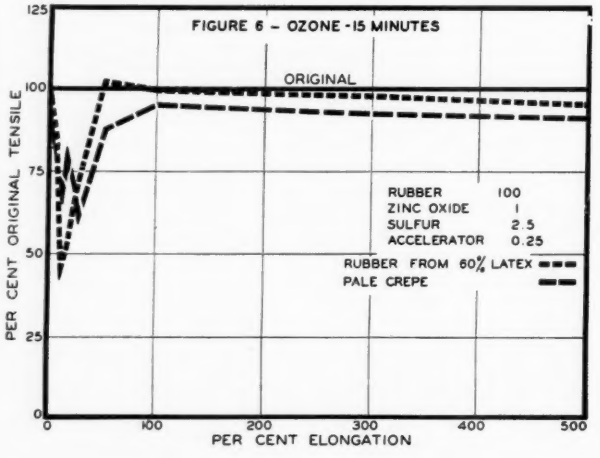












In all three of these exposure test series three dumbbells of each compound were exposed at each elongation. The tensile strength value selected was an average of the two highest figures obtained when the dumbbells were tested.

Test Results and Conclusions

The results obtained when the percentage of the original tensile strength values were plotted against the elongation at which the sample was exposed, proved very interesting. (Figures 1-6.) Most noticeable is the fact that latex rubber, as does milled rubber, has a "critical elongation" between 5 and 25%, showing a definite drop from the tensile strength value obtained at no elongation. Table 3 shows percentage loss in tensile strength after exposure outdoors, in air and diffused daylight, and in ozone. In all cases the percentage was determined by taking the value obtained from the samples which were exposed at the "critical elongation" between 0 and 25%.

TABLE 3. PERCENTAGE LOSS OF TENSILE STRENGTH DURING EXPOSURE

Compound	Sun Exposure	Air Exposure	Ozone Exposure
L-1	32%	14%	20%
L-2	51	18	55
PC-1	59	26	14
PC-2	66	37	38

A careful study of this table and the graphs, directly comparing the latex and the milled rubber compounds, indicates that the latex type is, in almost all cases, more resistant to deterioration than the milled rubber. It can readily be seen that the latex rubber compounds are far superior to the milled rubber compounds in resistance to the action of sunlight and air, but the latter are more resistant to the action of ozone at low elongations.

Another interesting observation from this work is the additional proof of the previously established fact that increasing the sulphur content results in poor aging. Somerville *et al*[6] showed that increasing the sulphur content of a compound decreases its rate of deterioration in ozone and sunlight.

In general latex rubber, stretched and unstretched, reacts the same as milled rubber when aged. Sunlight aging reduces the tensile strength quite considerably. Samples aged in air in the absence of sunlight do not show so great decreases in tensile strength as do those which are aged in the sun. As may be seen in the graphs, there is a sudden drop from the original values, at low elongations, followed by partial recovery and generally a flattening out of the curve.

The curves for ozone exposure are, in some cases, somewhat similar to the curves for air aging. However, although they sometimes show a greater drop to the minima, they also make a more complete recovery toward the original percentage of the tensile strength values, and often go even higher as the exposure elongations increase. (Figures 2, 3, 5, and 6.)

It is apparently impossible to determine the exact "critical elongation" of these compounds with the available data set forth here. However it can be definitely stated that their "critical elongation" is between 5 and 25%. In several cases the presence of two minima, rather than the expected one, has eliminated the possibility of finding an exact figure. In addition, from the curves, it can be seen that there seem to be different minima for two different types of exposure. It is probable that with a greater number of samples exposed at each elongation, a much more accurate value could be obtained.

In conclusion, the following facts may be restated.

1. Latex rubber and milled rubber both have a "critical elongation" between 5 and 25%.
2. Latex rubber does not deteriorate for a given period of time so severely as milled rubber in outdoor and air exposure, but it is inferior in resistance to ozone at low elongations.
3. Increasing sulphur content results in poor aging on exposure to sunlight and ozone.
4. Ozone attacks rubber violently at low elongations, but it has a more nearly negligible effect at higher elongations.
5. In general, sunlight, air, and ozone have a very similar effect on stretched and unstretched latex rubber and milled rubber.

The author wishes to thank his colleagues at the laboratory of the R. T. Vanderbilt Co. for their assistance with and criticism for the work of this paper.

Permoflex Elastic Strand

PERMOFLEX elastic strand[1] is essentially a textile-covered rubber thread in which the textile covering is securely bonded to the rubber thread by means of a suitable adhesive. On the market for more than two years, Permoflex is said to have met with success because of its ability, when woven into fabrics, to withstand needle cutting and to resist repeated washing without breaking down.

The American Mills Co., New Haven, Conn., creator and manufacturer of the new strand, recently announced the granting to Everlastik, Inc., Chelsea, Mass., a license to manufacture elastic webbing under the Permoflex patents.

Adhesive Bond

In bonding the textile covering (cotton, wool, silk, rayon, etc.) to the rubber thread or core, a thermoplastic or heat-activatable adhesive-forming material, rather than a wet cement, is used. Although balata, gutta percha, or other materials may be used as a bonding agent, the preferred method is to utilize rubber so compounded that it will not soften at temperatures at which the textile covering is to be applied, but that it will soften and then vulcanize or set below a temperature that would be detrimental to the rubber core which has been vulcanized previously. The heat activation takes place after the textile covering has been applied and may be administered when the covered elastic body is in the form of either yarn or fabric.

A suitable compound for an adhesive, in parts by weight, comprises: rubber, 100; zinc oxide, 5; zinc sulphide, 5; stearic acid, 3; sulphur, 3½; mercaptobenzothiazole, 1½; sym. di-beta-naphthyl-para-phenylene-diamine, 1.

[1] U. S. patents Nos. 2,146,965 and 2,146,966, Feb. 14, 1939.

Covering Processes

There are two basic covering processes, one in which the adhesive is applied to the rubber in sheet form before the threads are cut, and one in which the adhesive is in the form of a ribbon which is applied over the rubber core.

In the first method the vulcanized rubber sheet is passed between two rolls, and a thin coating sheet (0.002- to 0.003-inch thick) of adhesive is applied with pressure to both the upper and the lower surfaces of the rubber sheet. The treated sheet is then passed through a slitting machine so as to be cut into thread. In a partly stretched condition the thread is helically wrapped with the textile covering. The rubber core in this process is either square or rectangular in shape with only two faces covered with adhesive. The tension at which the covering is applied should be sufficient to press in the four corners and cause the adhesive to flow around the uncovered faces of the core. This not only increases the uniformity of adhesion, but reduces the thickness of the coating on the treated surfaces. The covered elastic strand is finally subjected to heat (either before or after its incorporation into a fabric) which renders the adhesive sufficiently soft or tacky to bond the covering to the core.

In the second basic method the rubber core may be round, rectangular, or of other cross-sectional shape. The adhesive in the form of a ribbon is helically wrapped over the rubber core. Over the adhesive-covered core the textile covering strands are also wrapped helically, but in a direction opposite to that of the adhesive ribbon. As in the first process, heat is then applied to promote adhesion.

Korogel for Ceramic Casting

KOROGEL, after six years of field experience, has proved adaptable and useful as a mold material for casting plaster of Paris, Hydrocal, Keene's Cement, Portland cement, and other types of synthetic stone used in the ceramic casting industry. In this application Korogel replaces glue and is particularly applicable to the production of plaster of Paris statuary and artware. It is also being used by dentists and dental colleges, pottery manufacturers, and manufacturing jewelers.

Model Materials and Treatment

Korogel molds can be made by using models of wood, metal, plaster of Paris, Hydrocal, Metal Casting Powder, Keene's Cement, and almost any other rigid material. A solid metal or electroplated plaster model is easier to use and produces a finer mold surface.

Models made from plaster of Paris, Hydrocal, Metal Casting Powder, or Keene's Cement should be thoroughly dried by heating at least 12 hours at 150° F. or higher. Moisture in the model will cause porosity in the mold. After the model is dry and while still warm, a thin coating of high-grade lubricating oil or a mixture of one part by volume of French chalk and one part white vaseline should be applied. The interior face of the outside case of the mold should be also treated with the chalk-vaseline mixture or with glycerine to prevent adherence of the Korogel.

Models made from metal, glass, marble, or similar materials require no such treatment, but a thin coating of vaseline is helpful in removing the mold after it has been poured.

Mold Making

A Korogel mold is made in substantially the same way as a glue mold, with a few variations because of the higher melting and pouring temperature of Korogel. There are three important precautions to be observed in handling Korogel: it must be melted in an enameled container; it must not come into contact with metal while being melted; and it must not be heated above 310° F.

Korogel may be melted by several methods: in an enameled or glass container on an asbestos mat over a slow gas flame and with continual stirring; in a double boiler using oil as the heat transfer medium; or in an electric heater, especially designed for this purpose.

After melting, the Korogel should be allowed to stand to permit air bubbles, which would form holes in the mold, to rise to the surface. These bubbles may be removed by flashing a blow torch or gas burner across the surface. With the air removed, the temperature is allowed to drop to the point where the Korogel will just flow (approximately 290° F.). However if a metal model is used, cooling is not necessary.

In pouring the mold, the model should be arranged in the ordinary manner, with the pouring funnel at the high end, and with all high points of the mold fully vented. The model should be heated to 150° to 175° F. just prior to pouring to insure uniformity of flow when the Korogel is introduced slowly into the cavity. Cooling time depends upon the size of the mold, but in any event overnight cooling should be allowed before disturbing the mold assembly.

[1] Plasticized polyvinyl chloride (Koroseal) product of The B. F. Goodrich Co., Akron, O.

Advantages of Korogel

Korogel is not affected by water or the common materials found in casting shops, or does it require sizing or other treatment between casts. It is not affected by atmospheric conditions, and it will not deteriorate with age. Furthermore Korogel will not shrink, expand, or distort in service. With reasonable care, over a thousand casts may be prepared from the same mold. Korogel can also be remelted and used over and over again.

The American Way

(*Continued from page 32*)

hour. No longer does the infantry, footsore and weary, plod 25 miles a day. It now covers twice that distance in a single hour in its rubber-tired cars and trucks. The romantic picture of galloping horses wheeling field artillery into position has been rudely cut from its frame. Guns many times larger and heavier, mounted on pneumatic-tired carriages, are now swiftly towed by trucks and tractors. Since the last war, airplane landing speeds have increased sharply. Modern pursuit ships must have tires capable of withstanding the terrific impact of landing speeds as high as 100 miles an hour. And large quantities of rubber are required for gas masks, raincoats, bullet-proof tubes, leakproof gasoline tanks, barrage balloons, and many other items of equipment needed by mechanized and motorized armies.

But rubber is as necessary behind the battle zone as it is in it. With industry running in high gear to supply the army and navy with war materials, clothing, food and other essentials, rubber-tired motor vehicles are vital to the rapid transportation of raw materials and the quick distribution of finished products.

It is inconceivable that any large industrial organization would, today, dispense with its research activities. No manufacturer who hopes to continue serving the American public can afford to coast along on his present products or remain satisfied with his present processes. To do so would be to invite disaster, because his competitors will surely continue to seek new products and search for better ways of making them. Thus, the truly American spirit of competition supplies the incentive for continuous progress and this, in turn, results in marked benefits for all the people of this country. That is the industrial interpretation of what we call "The American Way." That is the philosophy and practice which has made this nation great. No other industrial system in the history of the world has been so successful, so just and so advantageous to the employer, the worker, and the consumer. It is "The American Way!"

ACCORDING TO THE TIRE & RIM ASSOCIATION, INC., Akron, O., wide base tires and rims have been adopted by the industry on the rear wheels of farm tractors to such an extent that the number of wide base rims now being produced is more than three times that of the conventional type. As regards passenger cars, this development is still in the experimental stage.

Automatic Smothering of Liquid Fires

P. W. Eberhardt[1]

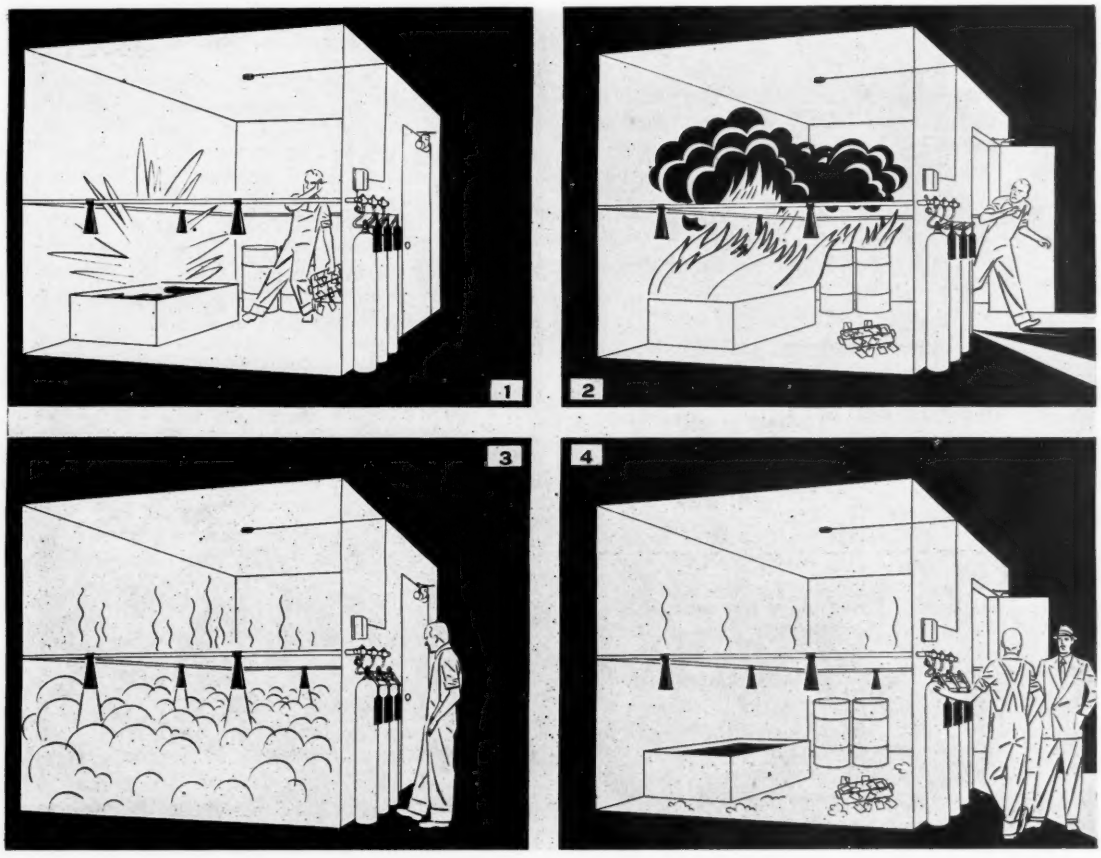
SINCE a large percentage of the fires in rubber goods plants are traceable to ignition of flammable liquids, safety engineers have devoted more time and thought to controlling this type of blaze than any other. Furthermore when such fires occur in spray- and dip-tank, churns, and kettles, they usually ignite with such speed and burn with such heat that employes are rendered incapable of the clear thinking needed for first-aid fire-fighting. Thus many of these fires get out of control because of panic, and there are numerous records of such liquid fires being disastrously spread by water streams used by confused employes.

To combat these swift and vicious blazes, which can burn fiercely on the surface of water, engineers have long sought an extinguishing technique for liquid fires that eliminates the human element entirely. Foremost among such techniques is the automatic gas smothering method which takes for granted that employes become panic-stricken when fire strikes and therefore leaves nothing for them to do, but retreat to safety.

[1] Walter Kidde & Co., Inc., New York, N. Y.

The gas is carbon dioxide or "dry-ice" vapor, and it is stored under high pressure in steel cylinders at a point near the hazard. Heat sensitive detectors are located above the hazard or inside of an enclosure; and within a few seconds after a fire breaks out, the valves on the cylinders are automatically opened. The carbon dioxide rushes through a piping system and billows from nozzles in gas form into the room where the fire is burning—smothering it in a few seconds. It functions by quickly cutting the oxygen content of the air to a point at which the liquid cannot burn. For example, solvents such as gasoline require 16 or 17% oxygen content in order to burn, and the carbon dioxide discharge quickly brings the oxygen content of an entire room well below this combustion point.

In some plants these flammable liquid processes are carried on in small rooms, and only a few cylinders of carbon dioxide are required to flood the entire enclosure.



Diagrammatic Sketches Showing the Installation and Effectiveness of Carbon Dioxide Equipment for Extinguishing a Flammable Liquid Fire in an Enclosed Area

Fig. 1. A Flash Fire Starting in a Flammable Liquid. Fig. 2. The Rapid Temperature Rise Sets Off the Actuator on the Ceiling and Automatically Releases the Valves on the Carbon Dioxide Cylinders. Fig. 3. Clouds of CO_2 Gas Billow from the Nozzles. Blanket the Floor, and Flood the Entire Room, Thus Reducing the Oxygen Content of the Air in the Room from Its Normal 21 to 14% or Less, at Which Point Fire Cannot Burn. Fig. 4. After the Fire Is Extinguished, Ventilation Resumed, and the Non-Toxic Carbon Dioxide Dissipated, the Liquids Remain Uncontaminated, and No Clean-up Is Necessary

In other plants, where large areas can become contaminated with combustible fumes from low flash-point liquids, batteries of cylinders holding hundreds of pounds of the gas are used to cope with sudden flash fires which spread with amazing swiftness. On some processes it is possible to arrange the pipes and discharge nozzles so that the gas clouds envelop only the point in the equipment or the surface of the tank where the fire may burst out. This latter method is known as "local application."

In rooms which are completely flooded with the carbon dioxide automatic closing of doors and windows is necessary to prevent escape of the gas. This is done by trip devices in the gas piping, which retract pins when the carbon dioxide rushes through, thus releasing window and fire-door chains. It is also possible to make the released gas shut off electric motors, fans, and pumps in the room, and where wall openings and ducts cannot be mechanically closed, screening nozzles are used to project jets of the gas across the opening, shutting off the oxygen supply as effectively as a door.

Some of the flammable liquids which cause serious fires in rubber goods plants give off flammable fumes at normal temperatures; while others are most dangerous when heated. All of them burn fiercely when they ignite, and there is constant danger of spreading and involvement of entire buildings. Static and electrical sparks cause about half of these fires, and many a disastrous blaze can be traced to an employe who has a faculty for collecting static in his body. Such human "spark-plugs" need only pass near a metal object to cause a spark to jump—and a fire to break out in a volatile liquid.

Another advantage of carbon dioxide is its low cost. It is easily obtained from coke ovens and from other combustion processes. Also it is non-toxic and does not harm human tissue or delicate materials, and it quickly dissipates after a fire is smothered, leaving no mess whatsoever. It has the faculty of penetrating past obstructions which hamper liquid extinguisher streams and for the same reason can smother an overflow fire running down a wall or over the rim of a tank.

Early Goodyear Letters

P. W. Barker, business specialist for rubber and rubber manufactures, Leather and Rubber Division, Department of Commerce, Washington, D. C., after reading in our March, 1940, issue of the letter written by Charles Goodyear, April 4, 1825, relative to a hardware order, which is now in the possession of Ralph F. Wolf, wrote us that he knew of five older letters. These are owned by an autograph dealer, Forest H. Sweet, 46 Green St., Battle Creek, Mich., refer to the hardware business of A. Goodyear & Son, Philadelphia, Pa., and are dated May 21, 1823, June 3, 1823, June 6, 1823, June 19, 1823, and March 3, 1825.

The dealer also has other letters of a similar content, some from Philadelphia and some from New Haven, probably written by the inventor, but signed "A. Goodyear & Son," dated June 10, 1822, May 19, 1823, July 22, 1823, July 31, 1823, October 13, 1824, October 18, 1824, December 16, 1824, February 28, 1825, and March 17, 1825.

The same collection includes other letters probably written by Goodyear's father and brothers, but all signed with the company name. One, however, is signed "Cynthia Goodyear," the inventor's mother.

The collection also includes a letter from Charles Goodyear to Prof. Benjamin A. Silliman, of Yale College, concerning Goodyear's experiments involving rubber, sulphur, and other materials, which also contains an excuse for not paying the professor for experiments he had performed for the inventor.

The National Museum, Washington, D. C., displays a missive from Goodyear to Wm. C. De Forest, December 15, 1840, from New Haven, relative to the first of many loans to the discoverer of vulcanization for his experiments with rubber.

Mr. Barker himself owns a Goodyear letter of March 17, 1829.

Para Rubber Trade

(*Continued from page* 36)

region of the world is being ransacked for the raw material.

While the Messrs. Hotchkiss and I were together, we did some good to others, I think, in introducing into the Amazon country among other things, American clocks and matches, and also the Brazil axe made by Collins & Co., which was and still is a most useful implement for rubber gatherers and others. We were also the first to use American gold in purchasing instead of Spanish and Mexican dollars, the former of which then could be had only at about 12% and the latter at 5% premium. This for a while was greatly valued by the importers here.

German Patents

(*Continued from page* 40)

tion of Derivatives of Unsaturated Acids." This claim reads: "Salts or derivatives of acids of the type of crotonylidene cyanacetic acid with substituted carboxyl groups subjected to the action of free bases or such substances as act alkalinely in aqueous solution." *Example:* 12 parts by weight of the sodium salt of crotonylidene cyanacetic acid are dissolved in 60 parts of water and combined with 4 to 5% of the acid quantity of sodium hydroxide in the form of normal sodium hydroxide solution. After two hours the mixture is acidified, and the polymerizate separates out as a resin, hard and brittle after drying. This product is readily soluble in alcohol. In other examples, with the crotonylidene cyanacetate, butanol and hydrochloric acid are used. This product is soluble in acetone, butyl, and amyl acetate. The butyl acetate solution leaves a transparent film of exceptional elasticity.

(*To be continued*)

Philippine Footwear Exports Up

The growing manufacture in the Philippine Islands of rubber footwear is now resulting in substantial shipments to the United States. Imports of rubber-soled canvas footwear into the United States from the islands in the first eight months of 1940 numbered 201,546 pairs, value $53,948, compared with only 8,152 pairs, value $2,683, in the same period of 1939. Imports of waterproof rubber footwear in the same eight months of 1940 amounted to 37,413 pairs, value $11,037, against 300 pairs, value $235, in the entire year of 1939.

Cooling Foam Rubber in Process

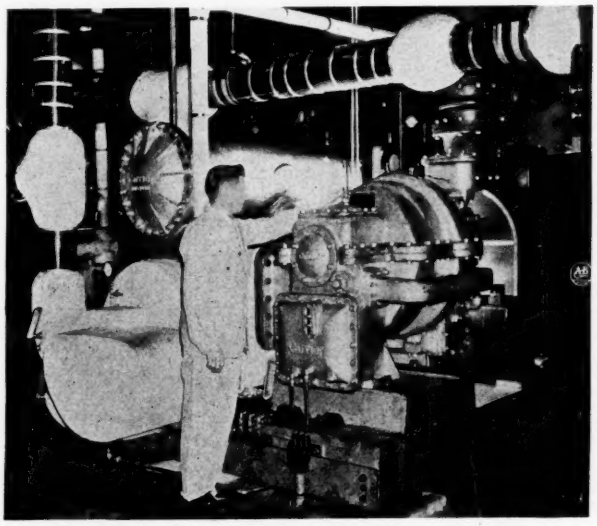
W. S. Bodinus[1]

AMONG the refrigeration problems encountered in the rubber industry, the proper control of temperature in the frothing of latex for the manufacture of sponge rubber is of prime importance. The following discussion is related to an actual installation by a large producer of foam rubber.

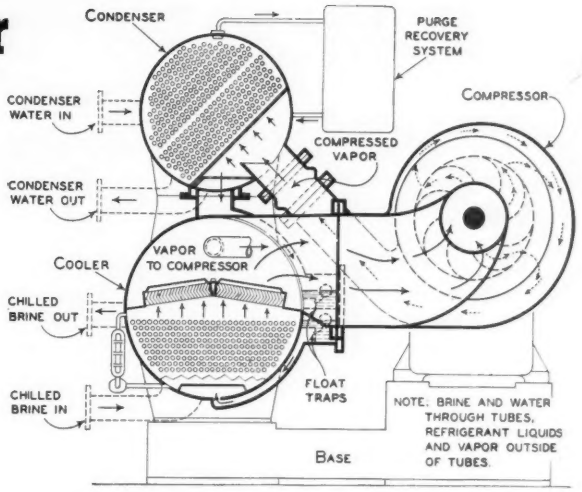
Latex, the base for the product, is a very unstable material and is affected by temperature changes. From storage through the various steps of processing, the latex is held at a constant temperature. In an early stage it is beaten and whipped by a device similar in design to a household egg beater. In this step it is essential to maintain a constant temperature to prevent coagulation of the latex. River water, frequently the source for refrigeration in similar processes, is insufficient to hold the latex at the desired temperature during summer weather. Outside weather conditions and fluctuations in river water temperature add to the problem of maintaining a close tolerance on the temperature of the latex. For this reason a centrifugal refrigerating machine was installed to handle the cooling of the latex in the churns.

Because schedules must be timed for production and without regard for the refrigerating equipment, only one of these churns may be in operation for a short time, then shut down, and a few seconds later as much as 80% of the total load may be imposed on the apparatus. This variation in refrigeration load ranges from 15 to 150 tons[2] in but a few minutes. The fluctuation in the volume of necessary heat removal must be compensated by the refrigerating machine with no appreciable deviation from the 35° limit demanded by the engineers. It is evident that the control for this equipment must be accurate but simple, as slight variations in temperature above the limit would be detrimental to the product, and lower temperatures might be injurious to the equipment—a decidedly rigid requirement for a refrigerating machine.

[1] Carrier Corp., Chicago, Ill.
[2] One ton of refrigeration is the equivalent heat extraction that would be performed by a ton of ice in a period of 24 hours.



Turbine-Driven Centrifugal Refrigeration Unit



A Schematic Diagram of a Carrier Centrifugal Refrigerating Machine Showing the Cycle of Operations

A precise control is afforded by an automatic suction damper. The pneumatic temperature controller consists of a thermal bulb located in the chilled water as it leaves the refrigeration apparatus and a recording and controlling mechanism which supplies to or bleeds air from a damper motor. As the temperature of the leaving water increases, the damper regulator opens to permit a more rapid evaporation of the refrigerant. Conversely, as the temperature lowers, the damper closes to decrease the evaporation, thus raising the temperature of the chilled water which is to be circulated through the churns. Variations in warm water temperature and subsequent loads on the refrigerating apparatus are virtually mercurial in action, requiring a precise automatic control of the machine at all times.

Selected for economy and efficiency of operation, the centrifugal refrigerating machine consists of a multi-stage centrifugal compressor, an evaporator, condenser, and a synchronous motor drive. Revolving at high speed, the compressor draws the vapor refrigerant from the evaporator and compresses it through a range of from 12 to 15 pounds. The refrigerant, Carrene, is non-toxic and non-inflammable and has a boiling point of 74° at atmospheric pressure.

Chilled water from the river is passed through tubes in the evaporator where Carrene is vaporized and drawn through the compressor. After being compressed the vapor is forced into the condenser where it is condensed by the cooling action of the river water which is passed through another bundle of tubes. The condensate is returned to the evaporator through a trap and enters at the bottom of the tank—completing a continuous cycle.

The centrifugal refrigerating machine was easily installed in the rubber plant as it was factory assembled and compact in design. Because of the inherent constant temperature characteristic of the apparatus, constant speed may be employed with few adjustments for temperature control. The capacity may be varied over a wide range by slight throttling of the compressor suction. Although this type of apparatus may be powered by a steam turbine or by a wound rotor induction, slip ring, or synchronous motor, the last named was deemed advisable to improve the power factor of the plant.

EDITORIALS

The Potential of the Rubber Industry

WHEN attempting to evaluate the status of an industry in relation to a defense program, there are four important points which should be considered: namely, 1, previous contributions influencing current means of defense; 2, availability of technical and such other facilities as are conducive to production under pressure and to new developments which may be required to supplement other industries; 3, relation of present capacity to normal commercial requirements; and 4, the amplitude of raw material supply.

The rubber manufacturing industry, which is founded on the ability to modify one basic type of raw material, has shown continued progress in its research to understand the possibilities of greater and more diversified service through development of new characteristics of its products. Continued advancement has been made by the rubber manufacturers and the suppliers in the perfection of compounding ingredients for rubber and the technique of formulation so that wide application and long life are possible. New synthetic rubber-like materials are increasing in number so as to create new properties in this industry's products and to enlarge the field for rubber and the knowledge of its performance.

Specifically and in addition to the many unheralded applications as a structural material in trucks, tanks, and aircraft, rubber has become a vital material in defense equipment in such forms as airplane deicers, bullet-proof gasoline tanks, armor plate of rubber and steel for airplanes, bullet-proof tires, rubber tracks for caterpillar-type tanks, and extra-heavy-duty tires for large trucks and gun carriages on which long range equipment may be mounted.

These and many other developments have been accompanied by the growth of technical staffs, in individual companies, equipped with knowledge and laboratories suitable for attacking such new problems as may arise. Likewise the experience gained by the processing personnel during the depression period, when the development of efficient practices was made necessary by existing competition, will be helpful as increased production of rubber products becomes necessary.

Although the rubber industry has been becoming increasingly active during recent months, there is yet available what is believed to be ample production capacity to accommodate apparent defense requirements without affecting normal civilian needs. In general the condition of machinery installed in rubber manufacturing plants is favorable to continuous and increased operation. Because of the specialized nature of rubber goods manufacturing, such additional labor as may be required need not be drawn from those who are skilled in metal working or chemical production. Therefore little or no confliction should exist with the industries which produce primary armament equipment. Instruction and training of new employes for specialized work is customary practice and can be readily accomplished.

The one limiting factor in the service to be rendered by the rubber industry is one which is beyond the control of individual companies and which can be influenced only by collective effort and governmental demeanor. That factor is the question of continuity of supply of the raw material, rubber. Plans have been laid and progress is being made toward the accumulation of moderate reserve supplies of natural rubber, and the ground work for possible manufacture of synthetic replacement materials is being developed. In the not-too-distant future greater security in the event of an interruption of the normal importation is expected. Close cooperation by the industry with certain governmental agencies is doing much to bring about internal measures as a protection against an emergency which if experienced would probably be temporary. The immediate problem becomes one of governmental diplomatic conduct.

Unless a complete cessation of natural rubber imports should occur, the rubber industry appears to be ready and able to absorb the increased business, which will necessarily accompany the consummation of preparedness plans, and at the same time continue to serve the normal civilian needs.

Price Structure

SUCH comments as have been made recently referring to "price control" may be the result of recollections of the great inflation which took place around 1917. Certainly no advances in selling prices are now evident which would justify regulatory procedures. Production costs depend on cost of raw materials and cost of work performed. In transforming these materials, management and labor have a stake and a responsibility. Individual desire for personal gain at any successive point can disrupt proportionate conditions and necessitate adjustments throughout succeeding operations. The people, who comprise management and labor, working together can avoid widespread inflation and price increases if they will refrain from taking advantage of such instances of scarcity as may arise and thereby eliminate any necessity of outside regulation. Increased business at present prices will result in greater income for labor and for producing companies. Higher remuneration through the performance of more work is much saner than an increase in unit prices obtained under pressure or because of the possibility of less resistance. An upward trend, once started, gathers momentum and often reaches proportions beyond the voluntary control of labor and management in which instance governmental intervention is the usual procedure.

S. C. Stillwagon

EDITOR

What the Rubber Chemists Are Doing

Rubber Division, A. C. S., Activities

Extensive Technical Program at N. Y. Group Meeting

ONE of the most ambitious meetings ever arranged by the New York Group, Rubber Division, A. C. S., was held on October 18 at the clubrooms of the Building Trades Employers' Association, Two Park Ave., New York, N. Y. Over 300 members and guests turned out for the afternoon technical session which consisted of the presentation of the three winning papers in the group's Prize Essay Contest, and a paper and motion picture on "Butyl Rubber—A New Hydrocarbon Product," which were presented by Dr. Per K. Frolich, Esso Laboratories of the Standard Oil Development Co. Following dinner, attended by 270, a sound motion picture on neoprene was shown, and an entertainer provided amusement with a humorous political speech.

Winners in the Essay Contest and the subjects of their papers follow: *first prize,* John V. Weaver, Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., "Determination of Scorching of Rubber and Synthetic Compounds by Use of the Mooney Plastometer"; *second prize,* W. J. Potter, R. T. Vanderbilt Co., "Exposure Tests of Stretched Vulcanized Sheets from Milled Rubber and from Latex"; *third prize,* R. O. Babbitt, Vanderbilt, "Some General Principles of Compounding Rubber Latex." The contest judges were: Harry L. Fisher (U. S. Industrial Alcohol), Emil Schwartz (General Electric), and H. A. Wakefield (Bakelite).

As described in Mr. Weaver's paper, the new scorch test is a modification of the Mooney plasticity test, and embodies the determining of the plasticity of the compounded stock at one-minute intervals. The test, conducted at a temperature of 250° F., is continued until the plasticity value reaches 100, and the time required to reach that figure is reported as the scorch value for the stock under test. In general a period of 10 to 12 minutes is considered a safe figure. Data were presented to show how the scorching tendency of a stock might be reduced by (1) the use of a retarder and (2) by the proper choice of accelerators. A comparison of the Mooney scorch test at 250° F. was made with the press-cure scorch test at 220° F., showing that the new test was much faster and gave the same general results as the pressure method. Curves depicting rate of cure and scorch tests of V-belt compounds (base gum, tie gum, cover skim, and cover friction) showed close correlation in regard to differences in curing rates of the four stocks. Scorch curves for rubber and neoprene compounds, with the test carried out at various temperatures were shown. A comparison of Neoprene Type E and Type G, showed that Type G scorches much faster than Type E. Likewise the activating effect of pine tar on Neoprene Type E was demonstrated. The speaker emphasized the advantage of obtaining scorch results in the form of a curve by plotting Mooney plasticity against time.

Mr. Potter's paper is presented in full on pages 41-43 in this issue.

Mr. Babbitt's paper discussed latex compounding generally, pointing out the methods employed to obtain specific results and the difficulties encountered in this field. The possibilities of synthetic latices were mentioned.

The paper and the motion picture on butyl rubber presented by Dr. Frolich were a repetition of the presentation before the general meeting of the A. C. S. and the meeting of the Rubber Division in Detroit in September.

The motion picture on neoprene, entitled, "The Story of Neoprene—the Chemical Rubber," was presented through the courtesy of E. I. du Pont de Nemours & Co., Inc., neoprene manufacturer, and was introduced by V. A. Cosler, of that firm. The film, directed primarily to the layman, depicted the production, properties, and applications of neoprene and was viewed with considerable interest.

The next meeting of the group, the annual Christmas party, will be held on December 20 at the usual place. At this meeting officers will be elected for the coming year. Charles Haynes (Binney & Smith), group chairman, has appointed the following nominating committee: Arthur Nellen (Lee Tire & Rubber), chairman; C. A. Bartle (Du Pont); and J. Miscall (Flintkote). It has been decided that in the future the Executive Committee should have at least one member from each of the following five districts: Metropolitan (New York City, Brooklyn, and Long Island); North Jersey; Trenton area; Southern Connecticut and Southern New York; Eastern Pennsylvania and Delaware.

The price of tickets to non-members at the December meeting will be double the price of member tickets. No memberships will be accepted after December 1, and those desiring to become members before this date should remit $1 to the secretary-treasurer, Peter P. Pinto, c/o *Rubber Age*, 250 W. 57th St., New York, N. Y.

Detroit Group to Hold Christmas Meeting

THE Detroit Group, Rubber Division, A. C. S., will hold a Christmas meeting on December 13 at the Detroit-Leland Hotel, Detroit, Mich. The speaker has not yet been decided upon; however it has been agreed to have someone talk on a general subject. Officers for 1941 will be elected at this meeting.

Los Angeles Group Opens Its 1940-41 Season

CHAIRMAN W. B. Holmes presided over the monthly supper-meeting of the Los Angeles Group, Rubber Division, A. C. S., which was held at the Mayfair Hotel, Los Angeles, Calif., on October 1, with 81 members and guests present.

Theodore Valle, the main speaker for the occasion, gave a very interesting account of his experiences in trading with the Ethiopian natives and tribes along the coast of the Red Sea. He commented on the customs of these people and their practices of witchcraft, voodooism, and primitive medicine. Hugh A. Martin, of the public relations department of the Union Oil Co. of California, entertained the group with a sound motion picture which depicted the struggle for survival among the various feathered, reptilian, mammalian, and insect inhabitants of the Arizona desert and a sea film, "Neptune's Mysteries," which was climaxed by a struggle between two octopi for a nest of eggs belonging to one of the combatants.

Fred Hiller won the special prize, a portable radio, donated by the Dill Mfg. Co., through William Holmes. The door prize, a table cigar lighter presented by Bert Dougherty, through the courtesy of the B. E. Dougherty Co., was won by M. B. Riggs, of Goodyear. Table favors, presented by The B. F. Goodrich Co., were "Pick-A-Bands."

The treasurer reported a profit of $28.32 on the fishing trip held last summer. The next meeting of the group will be held on Monday, November 4, so as not to conflict with the national election on the following day.

Chicago Group Hears Campbell on Carbon Black

AT ITS meeting on October 18 at the Hotel Sherman, Chicago, Ill., the Chicago Group, Rubber Division, A. C. S., tried a new program arrangement with evident success. Following a suggestion of members of the New York Group, the technical portion of the program was held at 6.45 p. m. before dinner. During dinner, in the College Inn of the hotel, members and guests were entertained by a leading "Jitter Band" and a floor show.

The speaker for the evening was Arthur W. Campbell, of the Commercial Solvents Co., Terre, Ind., who presented a paper on "Properties of Various Types of Carbon Black." In this paper Dr. Campbell compared the blacks as individuals and as members of a class of compounding ingredients. The carbon blacks used in rubber manufacture were separated into groups by the speaker on the basis of method of manufacture. The "channel" blacks were described as "arrested combustion" blacks; while Gastex and Fumonex, closely related to the channel

blacks, were said to be more truly "incomplete combustion" blacks. Thermax, P-33, and Shell carbon blacks were placed in a third group, characterized by production by thermal decomposition. Data were presented to show that the first two groups, both produced by a flame, are high modulus carbons, while the last group was characterized by low to medium modulus. The published data on particle size by various methods were reviewed, as were data on pH and its effect on carbon black. Slides were used to show the various carbon black manufacturing processes.

The group secretary, B. W. Lewis, Wishnick-Tumpeer, Inc., 6130 W. 51st St., Chicago, Ill., requests that members notify him promptly of any change in address.

Frolich Discusses Synthetics before Boston Group

DR. PER K. FROLICH, Standard Oil Development Co., speaking on synthetic rubber, and butyl rubber in particular, addressed the Boston Group, Rubber Division, A. C. S., at its meeting on October 24, held at the University Club, Boston, Mass. The dinner preceding the technical program was attended by 201 guests and members of the Boston group and the Northeastern Section of the American Chemical Society.

Instead of repeating his paper on butyl rubber, which was presented before the general meeting of the American Chemical Society and before the Rubber Division at the Detroit meeting in September, Dr. Frolich limited his coverage of butyl rubber to a motion picture and brief accompanying remarks. In speaking of synthetic rubbers he discussed only those types which involve vulcanization: (1) the straight butadiene polymers; (2) polychloroprene; (3) the butadiene copolymers; and (4) copolymers of olefins and diolefins (butyl rubber). The specific advantageous properties of each group were enumerated. Dr. Frolich concluded with remarks concerned with the availability of synthetic rubber in the event of an emergency. Government efforts in building up crude rubber stocks in this country were cited, as were the possibilities of increased use of reclaim. Dr. Frolich pointed out that the amount of rubber needed for military purposes alone was only a small fraction of our total requirements, but that in wartime the curtailment of rubber supplies for civilian purposes would greatly hamper the efficiency of military-purpose production. The speaker predicted that this country could, if necessary, be ready to produce a substantial portion of its rubber requirements synthetically in a period of two years. In closing Dr. Frolich emphasized the practically unlimited quantities of raw materials available and stated that to produce a quantity of synthetic rubber equivalent to our present usage would require only ⅓% (on a weight basis) of our annual crude oil production.

Chairman J. C. Walton announced that the three past group chairmen, Emil Krismann, R. J. Noble, and G. W. Smith would comprise the nominating committee to select a slate of officers to be voted on at the next meeting to be held on Friday, December 13, at the University Club. This meeting will combine a Christmas party with a technical program to be announced later.

Buffalo Group Hears Talks on Hycar

THE Buffalo Group, Rubber Division, A. C. S., held its first regular meeting since its organization in June at the Hotel Lenox, Buffalo, N. Y., on October 17. Dinner was attended by 87 members and guests; while attendance at the technical session totaled nearly 100.

The technical program was in the hands of F. M. Andrews, sales manager, and W. D. Parrish, in charge of technical service, both of the newly formed Hydrocarbon Chemical & Rubber Co., Akron, O., who centered their discussion on Hycar, the butadiene copolymer first announced by Goodrich as "Ameripol." Mr. Andrews urged an increase in the use of all synthetic rubbers in order that familiarity in handling these materials may be achieved before that possible day occurs when supplies of natural rubber may be cut off. The raw material of many of the synthetic rubbers and Hycar in particular, according to the speaker, is butane gas which can be produced cheaply in this country, and the 600,000 tons of rubber required annually here could be supplied by synthetic plants near the oil fields of Texas and Oklahoma. At present, said Mr. Andrews, Hydrocarbon is manufacturing two types of synthetics: one an oil-resistant type which will soon be available; and the other, a standard tire type which is being used in its entirety by Goodrich in making Ameripol tires and is not now available to the trade. Increased demand, it was asserted, will bring about the development of many other types, together with lower prices. Aside from the question of war conditions, the speaker stressed the following advantages of a domestic synthetic over natural rubber: price stability, reduced inventory requirements, and uniformity of raw material and finished product.

Mr. Parrish gave a résumé of synthetic rubber developments extending over the last 80 years and described how Germany during the World War utilized over 2,500 tons of "methyl rubber." He also showed the basic differences in structure and derivation of the several types of synthetic rubbers available in the United States today. Hycar O. R., the oil-resistant synthetic, was discussed in detail by Mr. Parrish, who stated that it gave products superior to natural rubber in regard to permanent set and creep and in resistance to oils, fats, petroleum solvents, heat, oxidation, fatigue, abrasion, printing inks and driers, dilute acids and alkalies. He further said that Hycar O. R. contains 2% phenylbetanaphthylamine as an age resister, and it may be reenforced with channel, semi-reenforcing, and soft blacks. Coal tar products and various high boiling esters were said to be the best softeners. Typical formulas, together with physical test data, were presented on slides and mimeographed sheets. On these sheets were nine different compounds: tread, heat-resisting, low set, highly loaded, soft compounded, clay loaded, soling, pure gum, and fast-curing types. In addition to regular physical test data, immersion results in various solvents were included.

The Rt. Hon. Geoffrey Beavencourt, unexpectedly present through the efforts of Colonel Kelly of the Niagara-Hudson System, presented an unusual after-dinner speech on the "War Behind the War."

Nominations Due for Goodyear Lecture Candidate

NOVEMBER 15 is the deadline for submission of nominations for the 1941, and first, Charles Goodyear Lecture, according to the Rubber Division, A. C. S. Names should be submitted to H. I. Cramer, University of Akron, Akron, O. The rules indicate that a statement must accompany the nomination giving the qualifications of the nominee, emphasizing the research which forms the basis of the nomination. The successful candidate will receive $200 and a special certificate.

The Goodyear lecture was established last year by the Rubber Division to stimulate interest in fundamental research on rubber and to recognize those men who have made conspicuous contributions in the field of rubber and related subjects.

Sections Notes

THE New York Section, A. C. S., held a meeting on October 11 at the Hotel Pennsylvania, New York, N. Y., which was in the nature of a discussion of Chemical Materials for National Defense. Among the scheduled speakers was Per K. Frolich, director of the Esso Laboratories of the Standard Oil Development Co., Linden, N. J., who talked on "Synthetic Rubber," reviewing the chemical and physical properties of the various synthetics and showing how they differ from natural rubber.

F. W. Sullivan, Jr., of The Barrett Co., 40 Rector St., New York, recently was named to the New York Membership Committee for 1940-41.

The North Jersey Section met on October 14 at Essex House, Newark, N. J., when the Industrial Group heard William F. Tuley, of United States Rubber Co., New York, discuss "Chemical Milestones in the Rubber Industry." He covered the developments relating to synthetic rubber, accelerators, antioxidants, latex, and reclaim. Dr. Tuley also talked along the same vein of thought before the High School Chemistry Teachers Club of New York at C. C. N. Y., Lexington Ave. and 23rd St., New York, on October 18.

Monsanto Chemical Developments

THE three products briefly described below are recent accelerator and antioxidant developments of the Rubber Service Department, Monsanto Chemical Co., Akron, O.

"Santocure," a condensation product of mercaptobenzothiazole with cyclohexylamine, is a delayed action, but powerful accelerator that produces its own activator when the curing process starts. It may be further activated by guanidines, aldehyde amines, thiurams, and some inorganic substances. It is said to produce high modulus and high tensile, particularly in lightly loaded stocks. "Santocure" discolors white stocks, but otherwise it is said to be practically unlimited in its application.

"Oxynone," 2.4 diamino diphenylamine, acts as an antioxidant, anti-plasticizer of unvulcanized rubber, and as an accelerator. Its stiffening action is said to prevent tubed mechanical stocks from flattening during vulcanization. When used alone as an accelerator, it becomes active at temperatures of 287° F. and above. As a substitute for litharge in wire stocks, it is said to produce insulation of high electrical resistance. Tests show that "Oxynone" materially retards heat generation in tire stocks.

"Santoflex BX" is a blend of "Santoflex B" and diphenyl para phenylene diamine and has the general purpose antioxidant properties of "Santoflex B." The presence of the diphenyl para phenylene diamine is said to improve further the flexing life of many rubber compounds, particularly those of the tread type. The diphenyl material discolors light stocks very badly.

Papers on Rubber to Be Presented before A.S.M.E. December 4 and 5

THE sixty-first annual meeting of The American Society of Mechanical Engineers will be held at the Hotel Astor, New York, N. Y., December 2 to 6. More than 100 papers will be presented at 44 technical sessions. The banquet will be held on December 4.

At the safety session on Wednesday afternoon, December 4, J. Milward, of William R. Thropp & Sons Co., will speak on "Safety Features in Rubber and Plastics Industries." There will be two sessions on rubber and plastics on December 5, scheduled for 9.30 a.m. and 2 p.m. The titles and authors of the papers follow: in the morning—"Design and Application of Phenolic Resin Asbestos Compositions in Corrosion Resistant Equipment," by W. H. Adams, Havey Corp., and "Supplementary Data on Load-Shear Relationships for Rubber," by J. F. Downie Smith, United Shoe Machinery Corp.; in the afternoon—"Creep Phenomena in Rubber," by S. H. Hahn, and I. Gazdik, B. F. Goodrich Co., "Notes on the Creep of Neoprene in Shear," by F. L. Yerzley, E. I. du Pont de Nemours & Co., Inc., and Annual Report of the Committee on Rubber and Plastics.

A.S.T.M. Approves D-11 Recommendations

AT A recent meeting of Committee E-10 on Standards of the American Society for Testing Materials a number of actions were approved on specifications and tests emanating from Committee D-11 on Rubber Products.

New Test Methods

Four of the actions concern proposed new test methods: Testing Rubber Compounds for Resistance to Accelerated Light Aging; Calibrating a Light Source Used for Accelerating the Deterioration of Rubber; Test for Tear Resistance of Vulcanized Rubber; Test for State of Cure (T-50 Test). The so-called "T-50 Test" was approved and given A.S.T.M. designation D 599—40T; while the other three methods were accepted for publication as information and comment in the Proceedings and compilation of A.S.T.M. Standards on Rubber Products.

Among the advantages cited for the T-50 Test as compared with combined sulphur determination are: greater speed and simplicity; applicability in certain cases where sulphur determinations are difficult or impossible. Use of T-50 is limited to rubber compounds with a relatively high elongation at break (generally 300% or over). It is mainly useful in controlling and checking uniformity of cure in production and as a tool in experimental work. It is not suitable for use in purchase specifications.

The method of testing compounds for resistance to accelerated light aging is intended for use as a static accelerated test applicable for estimating the comparative resistance of soft vulcanized rubber compounds to deterioration when exposed to light having a frequency range approximating that of sunlight, but a greater intensity in the ultra-violet range than sunlight. The companion method for calibrating a light source is intended primarily for use in measuring the intensity of radiation from the light source. It may also be used for measuring and integrating the intensity or total exposure from other light sources which are intermittent or variable in intensity, such as sunlight, and for comparing light sources.

The proposed test for tear resistance describes a procedure widely used for determining tear resistance of the usual grades of soft vulcanized rubber, but does not apply to hard rubber. Since tear resistance is affected to a large degree by mechanical fibering of the rubber under stress as well as by stress distribution, speed of stretching, and size of specimen, the results obtained can only be regarded as a measure of the resistance under the conditions of that particular test and not necessarily as having any relation to service value. The method is useful therefore only for laboratory comparisons and is not applicable for service evaluations except when supplemented by other tests and is not for use in purchase specifications.

Changes in Existing Methods

Changes are being incorporated in four existing methods of test. One change in Compression Set of Vulcanized Rubber (D 395) (Method B, constant deflection test) involves reporting compression set in terms of original deflection. The change in the Methods of Tension Testing of Vulcanized Rubber (D 412) covers the question of interpretation and analysis of data. In case the ultimate tensile strengths fail to check within 10% of the highest value obtained, additional specimens shall be tested until two or more such check results are obtained, according to the revision. The old figure was 5%.

Revisions in the Methods of Testing Rubber Insulated Wire and Cable (D 470) provide for better temperature regulation during the ozone resistance test and improvement in the determination of ozone concentration. Instead of dieing out the dumbbell test pieces after immersion in the Test for Changes in Properties of Rubber and Rubber-Like Materials in Liquids (D 471), this is now to be done before immersion. Also the time interval after removal of specimen from the liquid for determining tensile strength and elongation has been reduced from 24 to four hours.

Other Actions

Because the 120-hour air oven test at 121° C. is considered too long and too mild for the present type of compounds designed to resist heat and aging, it has been deleted from the Specifications for Insulated Wire and Cable: Heat-Resisting Rubber Compound (D 469), but retains the more severe air pressure heat and oxygen bomb test requirements.

Modifications in agreement with the National Bureau of Standard's new procedure have been set up in Sample Preparation for Physical Testing of Rubber Products (D 15), involving advances in buffing equipment and technique.

Based on extensive inter-laboratory cooperative work and contacts with other groups new tentative methods of chemical analysis (D 297) have been set up which are classified into four separate procedures as follows: complete procedure, rubber solvent method, short procedure, and copper and manganese determination in crude rubber.

Factex—A New Compounding Ingredient for Latex

FACTEX DISPERSION, Type A, a new compounding ingredient for latex, which was developed by the Stamford Rubber Supply Co., Stamford, Conn., consists of a partially vulcanized fatty oil dispersed in water. In producing the dispersion the degree of polymerization of the oil is carefully controlled so that the dispersion, when dried, produces a non-tacky elastic film. Factex Dispersion contains 70% solids with the dispersed particles of fine size.

In latex compounding, Factex Dispersion may be used up to 20% on the

(*Continued on page 82*)

New Machines and Appliances

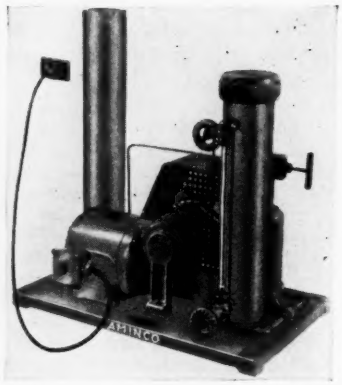
This Four- by Five-Inch Laboratory Mill Was Designed by the National Rubber Machinery Co., Akron, O., for Small Batch Production and General Laboratory Compounding. Said to Be Quiet in Operation, the Mill Is Equipped with Ground Chilled Rolls and Knee-Operated Safety Bars on Both Sides. Motor and Gears Are Completely Enclosed.

Pneumatic Transmission Systems for Remote Process Control

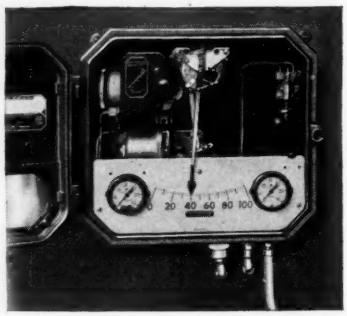
OFTENTIMES it is desirable to indicate, record, or control processing operations on a central panel board or in a control room remote from the point of measurement. In some instances this has been possible previously with pneumatic operated instruments; but it has entailed considerable expense, involving long lengths of temperature tube systems, high pressure leads, or manometer piping. The correlation of processing operations on a centralized panel has now been achieved through Taylor remote pneumatic transmission systems which utilize transmitting and receiving instruments that are connected by copper tubing.

The system utilizes standard Taylor instruments. It may consist of one or two transmitters connected to a receiver; or one or more receiving instruments, not necessarily near each other, and as far as 1,000 feet from the transmitter. Transmitters or receivers may be indicating, recording, or controlling types. Air pressure is the transmitting medium. In operation, the transmitter converts its pointer or pen position into a definite output air pressure which is transmitted to the receiver through the copper tubing. The receiver translates the air pressure back into a pen position corresponding to the pen position of the transmitter.

The new system is said to be highly accurate—well within ± 1% of the scale range. The speed of response of the receiver to changes in output air pressure from the transmitter is largely dependent upon distance. The maximum lag is one second per 100 feet of tubing. The new system is claimed to eliminate the hazards of electrical transmission in explosive atmospheres; also current failures will not disrupt its operation. For the operator out on the job the system provides an indicating or recording instrument for observation without the necessity of going to the control room. Taylor Instrument Cos., Rochester, N. Y.



Motor-Driven Booster Hydraulic Pump



Taylor Indicating Transmitter for Remote Pneumatic Transmission Systems

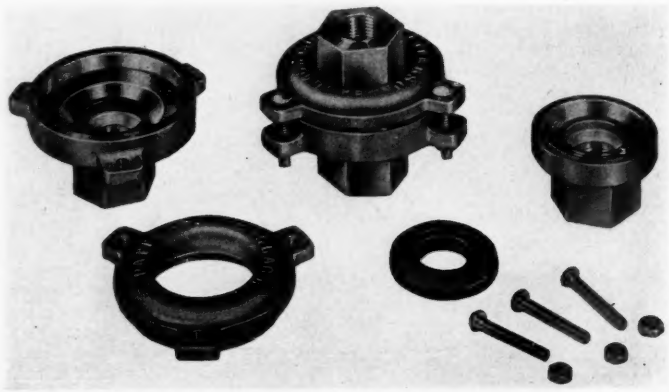
Motor-Driven Hydraulic Booster Pump

A MOTOR - DRIVEN hydraulic pump, capable of developing pressures up to 6,000 pounds per square inch, is said to be applicable for use in creating high test pressures for catalytic hydrogenation work; for determining the bursting strengths of cylinders, spheres, etc.; for operating high-pressure and hydraulic intensifiers; and for determining the effects of high pressures and their sudden release on various materials.

The unit booster consists essentially of a ⅓ hp. geared-head motor, a 3,000 ml. reservoir, and a 1,300 ml. compression chamber, all mounted on a cast-iron base. The pump, which operates at 58 strokes per minute, has a theoretical displacement of 553.32 cubic inches per hour. The unit weighs 200 pounds and has overall height of 25 inches. American Instrument Co.

Swing Joint for Steam Lines Uses a Special Rubber Gasket

STEAM lines with pressures up to 100 pounds per square inch are provided with a flexible connection in the form of a swing joint, specifically designed for rubber molding equipment. The joint is of heavy bronze and utilizes a specially shaped and compounded rubber gasket. This gasket contains a quantity of very finely divided metallic lead, milled directly into the rubber. Because of the lubricating action of the lead, the joint is said to turn freely under pressure. The gasket expands slightly when heated, a fact which aids in maintaining an efficient seal. The joint, which is made only in the ¾-inch straight style, weighs approximately 4½ pounds. Patterson-Ballagh Corp.



Assembled Swing Joint and Separate Parts

New Goods and Specialties

Gábor Éder

Wings for Shoes—Made of Du Pont Texon

Latex-Fiber Composition Shoe Trees

WINGED-SHAPE shoe trees are made of deep-grained "Texon" latex impregnated fiber, a durable shoe base material with two-way flex properties. The trees, known as "shoe wings," are lightweight and simply styled; they can be folded flat when not in use, and for travel can be carried in a neat little matching envelope. Made in a variety of colors, including brown, blue, white, and black, the trees are sold by Wayne Light Co. Texon is a product of E. I. du Pont de Nemours Co., Inc., Fairfield, Conn.

Rubber-Cushioned Grip for Bowling Balls

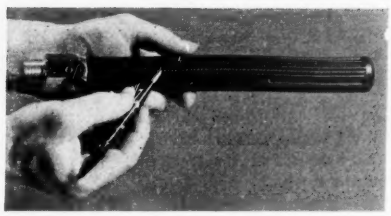
"EASY-HOLD" is a soft rubber cushion insert for bowling balls. After a ball has been drilled to suit the individual's grip, the thumb and the other finger hole are counterbored and red rubber cushions of the same diameter are inserted. It is claimed that this cushion will last the life of the ball, protect the thumb and fingers from blisters, and prevent slipping, yet release quickly and naturally. The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.

Surgeon's Gloves

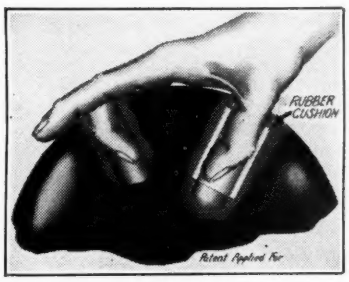
ROLLPRUF surgeon's gloves are made from latex with a flat band in place of the usual bead or roll at the wrist. Because of this feature, the glove is said to cling securely to the wearer's wrist or gown sleeve so that it will not slip or roll down. The Pioneer Rubber Co.

Gasoline Hose Nozzle Discharges Static Electricity

A FLEXIBLE nozzle for gasoline hose is made of a conductive synthetic rubber composition with spiral brass wires embedded in four of the 16 longitudinal stiffening ribs. These wires, the outer surface of which is flush with the surface of the ribs, make contact with the nozzle coupling to provide for static discharge through the hose. Uniform electrical potential over the entire nozzle is assured by the conductivity of the synthetic composition. It is said that the new nozzle has passed the tests of the Underwriters Laboratories, Inc. The B. F. Goodrich Co., Akron, O.



Synthetic Rubber Nozzle with Pencil Pointing to Spiral Brass Wire Embedded in Rib



"Easy-Hold" Grip for Bowling Balls

Storage Battery with Separators of Microporous Rubber

A NEW line of automotive batteries features separators built with microporous rubber a patented Fil-O-Matic cover that prevents overfilling; and a leakproof battery post bushing. The microporous rubber separator is said to have the advantage of permitting speedier circulation of the electrolyte through its pores and of being free from the disintegrating effects of high internal heat. To eliminate seepage of electrolyte around the battery posts, a lead bushing is molded into the rubber and welded directly to the battery posts. The Firestone Tire & Rubber Co.

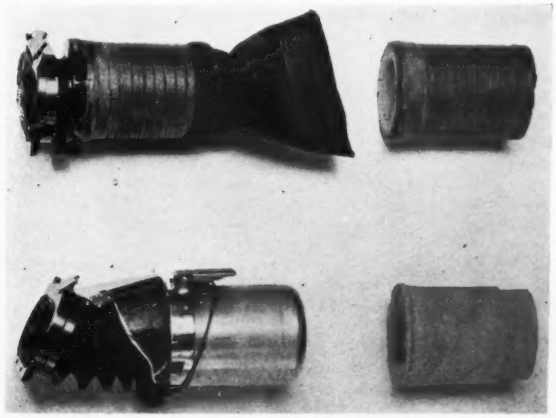
Vacuum Cleaner Utilizes Rubber

THE Hoover Model 60 vacuum cleaner is designed to use either of two types of filter bags: a cloth bag as standard equipment or a Hygienisac as optional equipment.

The cloth bag comprises a filter bag made from regular Filtaire fabric, and a resilient exhaust muffler which acts as a sound reducer and as a flexible member to permit movement of the handle and bag. The muffler in this case consists essentially of a sponge latex liner reenforced by a steel wire spring and covered on the outside with a thin sheet of rubber. The latex sponge, which is extremely porous, is said to reduce noise effectively because of the very small and interconnected cavities present in the rubber. The liner is a molded piece, or it may be formed from sheet stock. The thin coating of sheet rubber over the exterior of the bag is said to reflect a major portion of the sound which does pass through the sponge latex liner. Tests have shown that this muffler reduces the sound energy in the exhaust noise about 50%.

The Hygienisac consists of a special filter bag, enclosed in a rayon protective cover. The muffler assembly for this application also uses a sponge latex liner to reduce exhaust noise. However the liner is enclosed in an aluminum spun tube, and a molded rubber bellows provides for relative movement of the bag and muffler with respect to the main body of the cleaner. The Hoover Co.

Rollpruf Surgeon's Glove Made by Pioneer



***(Top Left)* Muffler Assembly for Cloth Bag of Hoover Model 60 Cleaner; *(Top Right)* Wire-Reenforced Sponge Latex Liner for Cloth Bag Muffler; *(Bottom Left)* Muffler for Hygienisac; *(Bottom Right)* Sponge Latex Liner for Hygienisac Muffler**

UNITED STATES

Defense Contracts Spur Industry

Business conditions continue to improve, and the upward trend seems certain for the balance of the year at least. Of course not every industry is experiencing such activity, but quickening within the commercial structure is widespread; while the government contracts for national defense will, directly or indirectly, affect every community. It is held by some experts that regardless of the outcome of the war, the high rate of operations within this country's major industries should go on for the next two or three years. Because producers of commercial goods believe government orders will get preference, they are placing protective orders and increasing inventories of many kinds of materials.

Unemployment recently declined to the lowest point since November, 1937, and it is anticipated that the draft will make further inroads. The demand still is for skilled labor.

Farm equipment sales have advanced sharply; a 20 to 25% rise in 1940 sales and capacity operations in 1941 are expected. The glass industry, also at a high level, likewise finds the outlook very bright. Construction contracts are setting new records. Furniture sales to date are 12 to 15% ahead of 1939 figures, and piano manufacturers began the last quarter of 1940 with the largest backlog of orders in more than a dozen years. The machine tool industry is operating at a record rate, which is more than double that of either 1939 or 1929. The machinery, aircraft, and shipbuilding industries continue their rise, and gains were also noted in October for footwear, oil, and tin production, output of railroad cars and locomotives, retail sales, and steel production (to the highest point on record, 95.7%). Fluctuations, however, occurred in carloadings, cotton and paper mill rates, and lumber, and power output.

Automobile production rose rapidly last month. Manufacturers have received contracts to make defense equipment, but do not believe these will interfere with normal operations inasmuch as, to a large extent expanded capacity is being provided. Car makers expect fourth-quarter output to reach record proportions, with the total for the year to approximate 4,400,000 cars and trucks. Many manufacturers also think that domestic sales of 1941 models will exceed those of 1940 by a moderate margin. Sales of new cars have been going well; but while those of used ones have been satisfactory, inventories remain relatively heavy.

Rubber manufacturers found October business even a little better than that of September, and they expect this improvement to continue, for defense orders placed with the rubber industry are materializing. Tire manufacturers are holding up fairly well, filling new equipment demand. Footwear, insulated wire, and mechanical goods are said to be quite busy. Manufacturers of rubber products again increased inventories; while shipments rose slightly.

CALENDAR

Nov. 4	Los Angeles Rubber Group. Mayfair Hotel.
Nov 8.	Akron Rubber Group. Akron City Club.
Nov. 8-9.	Industrial Management Society. 3rd National Time and Motion Study Clinic. Chicago Towers Club, Chicago.
Nov. 15.	American Section, S.C.I. Program on Plastics.
Dec. 2-5.	A.S.M.E. 61st Annual Meeting. Hotel Astor, New York.
Dec. 2-7.	14th National Exposition of Power & Mechanical Engineering. Grand Central Palace, New York.
Dec. 6.	American Section, S.C.I., and New York Section, A.C.S. Joint meeting.
Dec. 11-15.	National Chemical Exposition. Sponsored by Chicago Section, A.C.S. Stevens Hotel.
Dec. 13.	Boston Rubber Group. University Club.
Dec. 13.	Detroit Rubber Group. Detroit-Leland Hotel.
Dec. 20.	New York Rubber Group. Christmas Party. Building Employers' Trade Assn.
Dec. 30-Jan. 1.	Division of Physical and Inorganic Chemistry, A.C.S. Symposium on Structure of Molecules and Aggregates of Molecules. Columbia University, New York.
Jan. 6-10.	SAE Annual Meeting. Detroit.
Jan. 10.	Perkin Medal Award. Chemists' Club, New York.

EASTERN AND SOUTHERN

Neoprene Demand Increases Sharply; New Contract Offered for 1941

Demand for neoprene, which has shown a sharp increase with accelerated national defense activity, is currently running about 2½ times production, according to the manufacturer, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. In view of this demand-over-production, du Pont has been forced to allot its production with preference being given to vital defense needs; for example, synthetic rubber parts for airplanes and other war equipment for the Army and Navy. At present all rubber companies are receiving less neoprene than required, and most firms have found it necessary to curtail its use in regular commercial items in order to fill government contracts.

Present production of neoprene of 500,000 pounds monthly is expected to be stepped up to about 1,000,000 pounds per month by January, 1941. A new plant, which is nearing completion, will be in production in December with full capacity anticipated by January. According to du Pont, this plant expansion program was decided upon a year ago and was based on the firm's confidence in neoprene and the belief that it would find increased usage in normal commercial production.

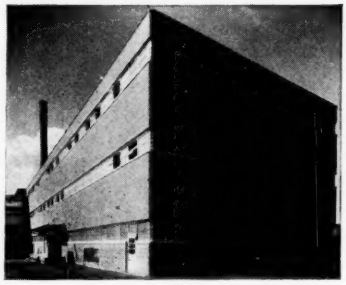
In addition to the above increase in capacity, announcement has been made that construction has been started for a still further enlargement of the neoprene plant. This newly planned increase of facilities for another 500,000 pounds per month is expected to be operating by October, 1941, after which the total monthly capacity will be 1,500,000 pounds.

Because neoprene is essentially a raw material, the arbitrary allotment system of distribution now in effect, even though it gives prime consideration to national defense items, has been considered undesirable as a continued practice. Thus, in 1941 neoprene will be offered to rubber companies on a new contract plan whereby those who wish to protect themselves may contract on a firm basis for enough neoprene to cover their known requirements during a part or all of 1941. Such contracts will specify delivery by months, actual delivery dates to be agreed upon later. In the event that total contract deliveries, requested for the early part of the year, exceed production capacity, the quantities for early delivery will, at the time of drawing contracts, be scaled down and those for later delivery will be correspondingly increased in accordance with the neoprene production capacity. This contract will place the sale of neoprene on a basis very much like that used in the sale of crude rubber, except that the price is subject to adjustment so that a contract customer will at all times pay the same price as a spot buyer; the only effect of the contract is a firm commitment on the producer's part to sell and on the customer's part to buy the quantities covered. The new contract will be submitted during the first week of November.

Whitehead Bros. Rubber Co., Trenton, N. J., is erecting a kitchen at its plant. Superintendent William A. Howell, 82, is reported improving in a Trenton hospital from a long illness.

Crescent Insulated Wire & Cable Co., Trenton, N. J., is swamped with orders for war material products. C. Edward Murray, Jr., vice-president, says the plant expects to be busy all winter.

Hewitt Celebrates New Building with Open House



"The Twombly Building"

Hewitt Rubber Corp., Buffalo, N. Y., on September 28 marked the completion of a plant-wide expansion and improvement program with Open House for its employes and their families. Formal dedication of the new primary department and warehouse building was made by President Thomas Robins, Jr., who unveiled a bronze plaque designating the name of the new edifice as "The Twombly Building," in honor of Earle K. Twombly, vice president in charge of manufacturing.

The new modern structure is three stories high, of brick fireproof construction. Glass brick windows on three sides are so designed that light is reflected to the ceilings; while conventional casement windows on the fourth wall provide ventilation, and all windows are set high to provide maximum storage space and natural light. Glazed-tile interior walls facilitate cleaning. Railroad sidings service two sides of the building, and a truck unloading platform appears at one of the entrances to the structure.

Open House festivities included presentation to 54 employes of their service pins, recognition of employes whose suggestions led to improved manufacturing methods and working conditions, conducted tours of the plant, refreshments, and door prizes.

With the completion of the new building and the installation of the latest types of storage and mixing equipment, Hewitt has materially increased its plant capacity. All materials are handled automatically by special conveyers; while raw materials are stored in automatic dispensing bins and tanks, and automatic weighing equipment checks each batch before it enters the mixers.

Definitions under Export Act

In a recent listing of announcements under operation of the U. S. Export Control Act, the following was included in the developments communicated to the Division of Foreign Tariffs:

No. 19.—Rubber

(Instructions to Collectors of Customs by Division of Controls, October 1, 1940)

The following definitions are established in connection with the restrictions on the exportation of rubber:

"1. White mineral rubber is not a form of crude rubber and therefore no license is required for its exportation.

"2. Scrap rubber means only scrap from rubber which has been processed and partially consumed, and does not include crude rubber in the form of scraps, the latter resulting from the cutting or trimming of crude rubber. These crude rubber scraps require a license.

"3. Black rubber compound, sometimes called 'camelback,' is processed rubber, chiefly reclaimed, and does not require a license.

"4. Crepe soling is pure crude rubber and does require a license."

William M. Morse, editor emeritus of India Rubber World, is again wintering in Florida. He can be reached at 460 Highland Ave., Dunedin, Florida.

Need of Stand-by Plant for Synthetic Rubber Stressed

At a press conference in Washington, D. C., on September 30, Jesse H. Jones, Secretary of Commerce and Federal Loan Administrator, suggested erection of a stand-by plant for making synthetic rubber to insure a partial supply, at least, in case shipments of rubber to the United States from the Far East ceased for any reason. He said that if some guarantee could be given that these ship lanes would always be open, there would, of course, be no necessity of such a project, which, if ample to meet our annual consumption of rubber, would cost several hundred million dollars.

Mr. Jones also stated that conferences are being held nearly every day between R.F.C. and defense administration officials and representatives from du Pont, Firestone, Goodrich, Goodyear, U. S. Rubber, and petroleum companies to consider means to produce part of the nation's emergency rubber needs synthetically. These discussions will continue, with the problem of cost a main factor. The Defense Commission estimates the cost of synthetic at 25¢ a pound, against 18 to 20¢ paid by the Federal Government for crude rubber in its building of reserve stocks of which about 60,000 have been purchased. The Secretary of Commerce further revealed that estimates indicate a cost of $500 a ton of capacity to build plants for synthetic rubber output.

In case of a serious emergency curtailing the country's rubber supply, the United States could manage to fill its requirements by the use of synthetics, more intensive use of reclaim, and possible restriction of the use of rubber.

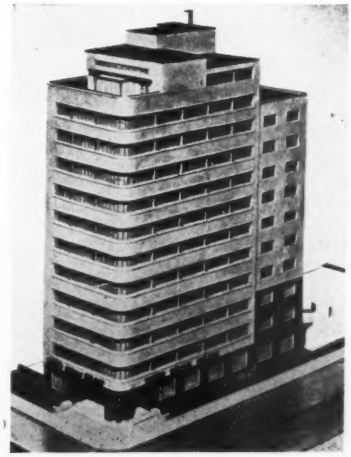
United Carbon Plans New Home and Is Erecting Another Plant

United Carbon Co., Charleston, W. Va., expects to complete its ultra-modern office building, on Kanawha Blvd. and Broad St., at a cost of more than $500,000, by March 31, 1941, when fitting ceremonies will mark its public opening. The streamlined building, 46 by 105 feet, will rise 12 stories, terminating with a penthouse and a smaller roofdeck; a basement and a sub-basement also are included. The structure will carry out United Carbon's traditional color scheme of gold and black, for the ground floor will be polished black granite and the upper stories gold-colored brick. Polished bronze trim will decorate the exterior. Glass brick will be used for stairway lighting; while the large corridor doors will be of the new Herculite glass, just as transparent as a window, but minus hardware marring the design. Of steel and fireproof construction, the edifice will contain 150 room-units besides clubrooms, dining quarters, and observation bay, and other special facilities. The floors in offices and corridors will be laid with rubber tile.

United Carbon will use the building as executive headquarters. The company will require the top six stories. The lower floors will be rented.

United Carbon, furthering its development and research program, is adding to its plant facilities by constructing a large carbon black plant at Aransas Pass, Tex., which will consist partly of new construction and partly of several of the company's carbon black units moved from Borger, Tex., and Monroe, La., and will embody many new features resulting from the research and development work conducted by the company. It will utilize residue gas from the Natural Gasoline Corp.'s 50-million cubic feet gasoline plant in the McCampbell Field, 2½ miles west of the plant site, which is within one-half mile from Redfish Bay on the Gulf Coast and also on the Southern Pacific Railroad, thus making its products readily available for coast-wise shipments to mid-Atlantic and New England states and for export.

The new plant was designed and is being constructed by the engineering division of United Carbon Co. and should be in operation soon after the first of the year.



Architect's Model of New Headquarters of United Carbon

New Muehlstein Golf Trophy

At the fall convention of the National Association of Waste Material Dealers, held in Cleveland, O., October 27, 28, and 29, the new Muehlstein Trophy, a beautiful sterling silver cup was placed in competition at the Monday afternoon golf tournament. The trophy, donated by Julius Muehlstein, of H. Muehlstein & Co., Inc., 122 E. 42nd St., New York, N. Y., may only be won by a member of the association or an executive in his employ and must be won by the same person three times to insure ownership. Those competing must have club handicaps of 20 or less, and the winner will be the player securing low gross. Also placed in competition at the convention was the Director's Trophy donated by Mr. Muehlstein some years ago.

Habirshaw Cable & Wire Division, Phelps Dodge Copper Products Corp., New York, N. Y., has appointed as cable engineer Kenneth S. Wyatt, one-time technical director of the Enfield Cable Works, Ltd., London, England, and more recently engaged in the development of the Hochstadter Compression Cable, having installed two systems for the Central Electricity Board of London, and others in Yorkshire and Hackney-Walthamstow. Prior to his work in England, Mr. Wyatt was associated with the Detroit Edison Co. for nearly ten years, developing improvements in high voltage cable insulation, both through research and also through extensive committee work in the American Institute of Electrical Engineers and in the Association of Edison Illuminating Cos. For a number of years before going to England, Mr. Wyatt served as a member of the Research Committee, and the Edison Gold Medal Committee of the American Institute of Electrical Engineers, the High Tension Cable Committee of the Association of Edison Illuminating Companies, and chairman of its sub-committee on Cable Research. Mr. Wyatt is also the author of many technical papers, several of which were awarded prizes by engineering societies. He was born in London and educated in Canada and at Harvard University. He belongs to the A. I. E. E., the A. C. S., and several other technical associations and committees.

New York Rubber Corp., manufacturer of mechanical rubber goods since 1851, Nine Rockefeller Plaza, New York, N. Y., according to Vice President W. C. Rogers, has been awarded considerable work for the government. The Airubber department at the plant at Beacon, N. Y., where inflatable air mattresses and rubber boats or rafts are made, is very busy on development work for the various branches of the government interested in such equipment. Within the next few weeks the company will start production on a sizable contract for air mattresses. The firm also plans putting up a new building or plant addition so that it may handle its regular business more efficiently. The Beacon plant recently was reconditioned and modernized.

E. H. White *(Left)* Presenting Golden Jubilee Gifts to Wm. J. Regan *(Right)*

U. S. Rubber News

United States Rubber Co., 1230 Sixth Ave., New York, N. Y., has appointed a National Defense Committee, consisting of Lucius D. Tompkins (committee chairman), Herbert E. Smith, and Elmer Roberts to effect "the fullest cooperation by the company with the United States Government in defense activities" and "to make available to our government's defense program every resource of this company, and to coordinate all departments so that the Army and Navy may call upon our resources at their full efficiency." The committee members are U. S. Rubber vice presidents and directors and members of its executive committee.

William J. Regan, 64, of 127 Rutland Rd., Brooklyn, N. Y., was honored by his co-workers at a luncheon on October 16, for having completed 50 years with U. S. Rubber. Mr. Regan has been a traveling salesman 41 years—perhaps a record—and is still selling for the footwear division; his customers include the big New York department stores. Mr. Regan's gifts included a gold watch, a token testimonial book of blue leather tooled in gold, and a ceremonial letter of congratulation from F. B. Davis, Jr., president of the rubber company, and members of the executive committee. These were presented by E. H. White, general sales manager of the footwear division. Mr. Regan has two sons, now also employed by the company

John J. Raytkwich, who had been covering 44 states semi-annually in the interest of safety for U. S. Rubber, on October 1 assumed new duties as director of safety at the Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.

Martindell Molding Co., Trenton, N. J., according to President Milton Martindell, is operating at capacity with three shifts, with many orders on hand for hard rubber products.

Bevis Longstreth, president of Thiokol Corp., Trenton, N. J., was on a lengthy business trip through the West.

Supply Contracts Awarded

Recent listings of United States supply contracts awarded include the following:

Navy: *cable,* General Electric Co., Schenectady, N. Y., $117,933.91, Habirshaw Cable & Wire Division of Phelps Dodge Copper Products Corp., Yonkers, N. Y., $128,218.34; *synthetic sodium nitrate,* Barrett Co., New York, N. Y., $29,400.

War: *antimony alloy lead,* National Lead Co., New York, $20,480; *belts, parts for,* General Dyestuff Corp., Chicago, Ill., $24; *cable,* Anaconda Wire & Cable Co., Marion, Ind.; $138,000, Collyer Insulated Wire Co., Pawtucket, R. I., $15,287.93, General Cable Corp., Perth Amboy, N. J., $47,160, Habirshaw, $109,640, Okonite Co., Passaic, N. J., $109,860; *combs,* Bolta Co., Lawrence, Mass., $6,800, Vulcanized Rubber Co., New York, $12,580; *overshoes,* Goodyear Rubber Co., Middletown, Conn., $40,208.04, Hood Rubber Co., Inc., Watertown, Mass., $41,000, United States Rubber Co., New York, $57,082.32; *raincoats,* Archer Rubber Co., Milford, Mass., 6,000 coats, Chicago Rubber Clothing Co., Racine, Wis., 10,000, Sigmund Eisner Co., Redbank, N. J., 83,502, Hodgman Rubber Co., Framingham, Mass, 30,000, U. S. Rubber, 93,000; *rubber sheeting,* Manufactured Rubber Products Co., 2,000 yards; *rubber testers,* Henry L. Scott Co., Providence, R. I., $1,005; *tanks,* American Hard Rubber Co., New York, $2,400; *tires,* Firestone Tire & Rubber Co., Akron, O., $102,740; *toothbrushes,* E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., $36,000; *wire,* Anaconda, $771,740, General Cable, $2,183,424.

The Treasury Department is requesting bids for rubber tires and tubes for regular use, not for defense, for a three-month period instead of six, as formerly, because during these abnormal times the market price of crude rubber might be subject to fluctuations which would adversely affect the manufacturer's bidding. These orders, for ordinary government maintenance purposes, total about $6,000,000 monthly.

Jos. Stokes Rubber Co., Trenton, N. J., continues to operate 24 hours a day with enough orders on hand for a busy fall and winter. William J. B. Stokes, 2nd, president, vacationed at Ashville, N. C.

General Electric Co., Schenectady, N. Y., according to President Charles E. Wilson, for the quarter ended September 30 received orders totaling $185,156,837, the largest amount of new business ever received by the company in a three-month period. The figure for the 1939 quarter was $79,510,205. Orders received for the first nine months of 1940 also created a record, $397,810,151, against $248,581,851 for the corresponding period last year. Mr. Wilson stated that largely as a result of the National Defense Program, GE had received orders from the United States Government accounting for a little more than one-fourth of the total business obtained so far this year.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has issued a new sound-and-color motion picture, "A New World through Chemistry," which interprets in 20 minutes many new developments, including nylon, plastics, dyestuffs, water repellents, and rayon, tracing their careers from the laboratory through the process of manufacture and into actual use. The film is offered for club and school showing and may be borrowed in 16-mm. size on an 800-ft. reel or 35-mm. size in a 2,000-ft. reel, at no charge except the cost of returning the picture.

Du Pont has announced that it will give to employes who have been with the company one year or longer two months' wages on induction into military service. Workers who have not had their vacation before starting such service will receive pay in lieu thereof as per the standard vacation plan. If employes apply for reemployment within 40 days after military service ends and if they reenter the company's employ, they will be given full service credit for the time in military service and two months after, not to exceed 14 months.

All Trenton, N. J., rubber manufacturers report increased business over the previous months. Nearpara Rubber Co., maker of reclaimed rubber, is now operating to capacity. National Automotive Fibre Corp. is busy supplying the automobile trade; while the Puritan Rubber Co. has increased working hours.

The Electric Storage Battery Co., Philadelphia, Pa., recently elected S. W. Rolph vice president. The company is constructing a manufacturing plant in Kansas City, Mo., adjacent its warehouse at 129 Belmont Blvd., to meet the constantly expanding demand for Exide automobile batteries.

L. Rohe Walter, advertising manager of the Flintkote Co., Rockefeller Center, New York, N. Y., was reelected president of the Direct Mail Advertising Association at its twenty-third annual convention held early last month in Atlantic City, N. J.

The New York N.A.W.M.D. Dinner Club, reenforced by a large contingent of Philadelphia members, on October 15 opened its fall season with a dinner at the Hotel Astor, Times Square, New York. Bridge was played later, and a prize awarded.

The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y., at its annual meeting October 17 elected F. L. Curtiss, of Raybestos-Manhattan, Inc., and John L. Collyer, president of The B. F. Goodrich Co., directors for terms expiring in 1941 and 1942, respectively. Directors elected to terms expiring in 1943 follow: G. B. Dryden, Dryden Rubber Co.; E. V. Germain, Dunlop Rubber Co.; A. B. Newhall, Talon, Inc.; Wm. O'Neil, General Tire & Rubber Co.; and Paul W. Litchfield, Goodyear Tire & Rubber Co.

The Columbia Alkali Corp., 30 Rockefeller Plaza, New York, N. Y., a division of the Pittsburgh Plate Glass Co., Pittsburgh, Pa., according to W. I. Galliher, director of sales, has opened another chemical sales office in the southeast in charge of J. R. Simpson, of Durham, N. C. After February 1, 1941, the office will be in Charlotte, N. C.

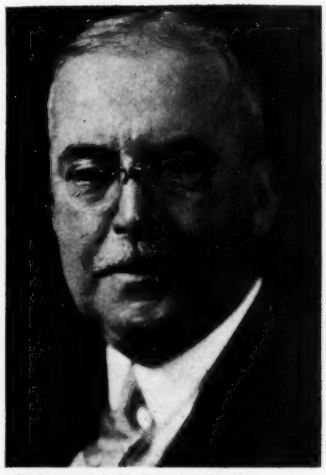
Mercer Rubber Co., Hamilton Square, N. J., reports business as very good. President William H. Sayen has returned from a business trip to Kansas City, Chicago, and other points in the Midwest.

Consolidated Products Co., Inc., machinery equipment, 15 Park Row, New York, N. Y., on October 10 gave a dinner at the Newark Athletic Club to B. M. Todd, superintendent of its Newark, N. J., warehouse, who retired after 21 years with the company and is its first employe to receive a pension. President A. M. Kahn made the principal address, and C. J. Gale was toastmaster. Mr. Todd received many gifts from his co-workers. His successor is Wm. Wolf.

Overman Tire Co., 151 Cortlandt St., Belleville, N. J., has ordered to be sold at public auction, November 19, under the auspices of Industrial Plants Corp., 90 West Broadway, New York, N. Y., property including rubber mill, laboratory testing, power house, and machine shop equipment. Inspection is invited from November 14 to the day of the sale.

Pierce-Roberts Rubber Co., Trenton, N. J., has let a contract for a one-story brick office building, and the old office will be used as part of the manufacturing plant. The company is busy at this time.

H. Muehlstein & Co., Inc., dealer in crude and scrap rubber and hard rubber dust, 122 E. 42nd St., New York, N. Y., has moved its Boston, Mass., office to 1145 Park Square Bldg., 31 St. James Ave.



Underwood & Underwood Studios

Edward J. Coughlin

E. K. Halbach, president of the General Dyestuff Corp., 435 Hudson St., New York, N. Y., again has been named chairman of the Dyestuffs Group in the 1940 membership Roll Call of the New York Chapter of the American Red Cross. In urging full support of the roll call, to be conducted from November 11 to 23, Chairman Halbach said:

"The American Red Cross has completed the first war year with double credit. Simultaneously this great organization gave continuous war relief to victims of invasion, and also carried on its regular domestic duties here. . . . War relief was provided in the form of ambulances, hospital equipment, medicines, food, nearly a million garments, over 5,000,000 surgical dressings. At home it aided victims of 102 disasters, and rendered many other services."

Essex Rubber Co., Trenton, N. J., continues busy in all departments and is offering displays of its various products in Trenton store windows. L. M. Oakley, company official, was on a business trip through New England.

OBITUARY

Edward J. Coughlin

ON OCTOBER 5, Edward J. Coughlin, veteran executive of the United States Rubber Co., 1230 Sixth Ave., New York, N. Y., died at his home in New York. He had joined the shipping department of the New York Belting & Packing plant at Passaic, N. J., on January 30, 1892. After three years Mr. Coughlin was made assistant superintendent of the factory, in 1901 superintendent, and in 1903 factory manager. He came to the U. S. Rubber general offices in New York in 1916 as general factory manager of the mechanical goods division. Four years later the deceased became a second vice president with supervision over all plants except tires and in April, 1929, was elected a director and a member of the executive committee. He held the last three titles at the time of his death. He had also served as a vice president of the U. S. Tire Co., Inc., and of Dispersions Process, Inc. For the past six years he had been chairman of the board of benefits and awards of U. S. Rubber; he was also chairman of its purchasing committee and of its insurance committee and in March had retired as a vice president of the U. S. Tire Dealers Corp.

Mr. Coughlin was born in Brooklyn, N. Y., on August 13, 1872. At the age of 11 he left grammar school and found work with a dry goods concern, but continued his education at night schools.

He belonged to the Lotos Club of New York and the Arcola Country Club of New Jersey.

Surviving are his wife, three sons, and six grandchildren.

Funeral services were held on October 8. Burial was in Cedar Lawn Cemetery, Paterson, N. J.

MIDWEST

Pliofilm Protects Historical Documents

The more than 300 pieces of original documents—newspapers, handbills, paper money, personal papers, etc.—included in the United American Historical Foundation's tour of American educational institutions, are protected with Pliofilm. With a view to acquainting Americans with the true history of this country, what is said to be the finest chronologically arranged exhibit of original materials outside of the Library of Congress is now being shown in a tour arranged by the School Assembly Service, Kimball Building, Chicago, Ill.

Monsanto Chemical Co., St. Louis, Mo., has announced that Harvey M. Harker, assistant general manager of sales of the Organic Chemicals Division, leaves this month for a year's survey of the chemical market in Australia, Tasmania, and New Zealand. Last April, Monsanto entered into an agreement with the Maurice A. Nicholas interests of Australia to establish facilities in South Melbourne under the name Monsanto Chemical Proprietary, Ltd., for the manufacture of acetophenetidin, sodium salicylate, salicylic acid, aspirin, and other pharmaceutical chemicals. Since then plans for the manufacture of sulphuric acid and phenol have been under consideration. Part of Mr. Harker's duties will be to assist in the development of production facilities for these products.

Skelly Oil Co., Tulsa, Okla., held its annual stockholders' meeting on October 18 at which J. D. Powell, vice president in charge of marketing, was named to the board to succeed the late William T. Atkins. All other directors were re-elected.

The National Safety Council, 20 N. Wacker Drive, Chicago, Ill., at the National Safety Congress, held in Chicago, October 7-11, announced the granting of 234 awards for outstanding accident prevention records in its Industrial Safety Contest conducted from July 1, 1939, to June 30, 1940. Included among the winners in the Rubber Section were: Trophy Winners: Group A & B, United States Rubber Co., Naugatuck, Conn., footwear plant, 8,155,327 man-hours with five reportable injuries; Group C & D, Van Cleef Bros., Chicago, Ill., 387,113, man-hours, Collyer Insulated Wire Co., Providence, R. I., plant, 224,404 man-hours, Canadian Lastex Co., Ltd., Montreal, P. Q., Canada, 221,074 man-hours, and W. H. Salisbury & Co., Inc., Chicago, 129,971 man-hours, and all four with no reportable injuries. Certificate Awards: Group A & B, U. S. Rubber, Indianapolis, Ind., plant, 2,532,311 man-hours, and Dominion Rubber Co., Ltd., St. Jerome, P. Q., 2,381,026 man-hours, and both with three reportable injuries.

Conveyor Belt Made of 48-Ounce Duck

In operation in the Fifth Vein Coal Co., Harrisburg, Ill., is a conveyor belt, said to be the first ever made of 48-ounce duck and the largest single-unit slope conveyor belt in the world. It was built by the United States Rubber Co., Rockefeller Center, New York, N. Y., and was installed by the McNally-Pittsburg Mfg. Co., Pittsburg, Kans.

The belt is nine-ply, 1,530 feet long, and 54 inches wide, weighing 35,000 pounds net. Run-of-mine coal is conveyed at 1,000 tons per hour at a speed of 350 feet per minute and lifted 206 feet up a slope of 16.5° from the coal seam. The belt has a soft weave and is said to be capable of withstanding a strain of 60 pounds per inch per ply, or one-third more than a similar belt made from 42-ounce duck. Because of added strength, it makes possible the use of conveyors one-third larger than ever before attainable, it is claimed.

Thirty-one rubber firms in the Midwest recently paid $442,000 in wages to 18,380 employes, a decline of 13.4% in payments, but an increase of 4.3% in workers from the previous month.

P. I. T. I. Names Governors

E. F. Lougee, chairman of the board, Plastics Industries Technical Institute, 186 So. Alvarado St., Los Angeles, Calif., has announced that a board of governors, men actively interested in the plastics industry, has been organized, for an advisory capacity only, to guide the educational program at the Institute and to cooperate with the technical director, John Delmonte, in its operation. The new board comprises: Donald Dew, Diemolding Corp., Canastota, N. Y.; Gordon M. Kline, Plastics Division, National Bureau of Standards, Washington, D. C.; Spencer E. Palmer, Tennessee Eastman Corp., Kingsport, Tenn.; and Louis M. Rossi, Bakelite Corp., New York, N. Y.

The school, which began classes on October 7, offers four general and two special courses: an Engineering Course; a Resident Day Course and a Resident Night Course; a Combination Course, which gives lessons by mail as well as work at the Institute; a Home Study Course, with no shop training; and a specially designed course in applied plastics engineering for aircraft engineers, custom or consumer molders, and shop superintendents. Among the 98 subjects listed in the P. I. T. I. curriculum are: Miscellaneous Resins (including Natural Resins, Rubber Derivatives, Alkyds, and the Polyamides); Synthetic Rubbers and Rubber-Like Materials; Rubber Chemistry—Introduction; and Molds for Cast Phenolics-Steel Mandrels and Rubber Molds.

Standard shop equipment is being installed, including an automatic molding, a preform, and compression and injection presses, fabricating machinery, and laboratory and testing apparatus.

NEW ENGLAND

Rhode Island Rubber Club Hear Defense Talks

ABOUT 120 members and guests attended a meeting of the Rhode Island Rubber Club, at the Metacomet Golf Club, East Providence, R. I., on September 27. Approximately 50 participated in an afternoon golf tournament which preceded the meeting.

Off-the-record talks were given by W. L. Finger, of The Rubber Manufacturers Association, Inc., and a member of the Advisory Commission to the Council of National Defense, and Clifton N. Lovenberg, executive secretary of the Rhode Island Industrial Commission. The subject of Mr. Finger's talk was "What Does the Government Expect of the Rubber Industry in the Present Emergency?" While Mr. Lovenberg discussed the role of the State of Rhode Island in the nation's defense program.

Officers for the coming year were elected as follows: president, John E. Marshall, Jr., (Collyer Insulated Wire); secretary-treasurer, Arthur J. Davis (Goodyear Footwear); executive committee members, L. K. Morrow (Anaconda Wire & Cable), F. P. Jecuso (U. S. Rubber), S. L. Lake (Respro), L. K. Youse (Firestone), T. F. Springer (Davol), D. Rhee (Carr Mfg.), and J. H. Christopher (Titanium Pigment). The retiring president, D. C. Scott, Jr., (Henry L. Scott Co.), also becomes a committee member.

Golf tournament winners were as follows: *low net,* C. P. Mullen and L. G. Whittemore; *second net,* C. P. Seavins and L. Yates; *low gross,* L. Colligen, W. Bruckhauser, W. Morrisey; *kicker's handicap,* F. F. Saloman. Prizes which went to golf winners and lucky ticket holders were made available through the generosity of the following:

Agar Mfg., American Zinc Sales, Arnold Hoffman, Barrett, Binney & Smith, Godfrey L. Cabot, Cleveland Liner, Continental Carbon, Curran & Barry, du Pont, Eggleston, Farrel-Birmingham, Federal Products, Gair, Industrial Paper, Ernest Jacoby, Kleistone Rubber, Meyer & Brown, Monsanto Chemical, H. Muehlstein, National Vulcanized Fibre, N. J. Zinc, Pequanoc Rubber, Phillips Bros., Respro, Henry L. Scott, A. Schulman, Wm. B. Shaw, Taylor Instrument, E. T. Trotter, R. T. Vanderbilt, Vansul, L. G. Whittemore, Chas. T. Wilson, and Wishnick-Tumpeer.

Lloyd Mfg. Co., Apponaug, R. I., has hired as chemist George R. Hill, formerly in the rubber department of the research laboratories of R. T. Vanderbilt Co., at East Norwalk, Conn.

Woonsocket, R. I., recently asked for bids on 1,000 feet of standard fire hose, but only two responses were received as most firms are busy with orders from England. The successful bidder was Gorham Fire Equipment Co., Boston, Mass., at $1.15 a foot.

Vultex Chemical Adopts New Name and Wider Scope

Vultex Chemical Co., 666 Main St., Cambridge, Mass., according to President Harvey J. Elwell, having expanded its capital structure because of the steady growth of business, has also changed the company name to General Latex & Chemical Corp., which contemplates the extension of its services in the general latex and related chemical fields. Vultex and all the materials formerly furnished by the Vultex Chemical Co. will be continued by the new organization, which will also complete all outstanding contracts of the original concern. The personnel remains unchanged, and the policies of the Vultex Chemical Co. will be continued by the General Latex & Chemical Corp.

Dr. E. A. Hauser, of the Massachusetts Institute of Technology, is conducting a course of instruction on "The Chemistry and Physics of Rubber and Allied Substances," sponsored by the University Extension Division, Department of Education, Commonwealth of Massachusetts, to acquaint students with the fundamentals of the chemistry and physics of rubber and substances exhibiting rubber-like properties. Discussions will cover: structural configuration of natural and synthetic rubbers, the changes which the molecular structure of rubber undergoes during processing, the changes undergone by synthetic rubbers, their final properties, an evaluation of these properties in regard to their molecular structure, methods for the study of structure and properties, and necessary equipment.

Classes, which began October 21, are held Mondays from 7:45 to 9:30 p.m.

Acushnet Process Co., New Bedford, Mass., according to Vice President T. W. Casey, is extremely busy and is specializing in the manufacture of precision molded rubber goods as well as synthetic molded rubber goods. Mr. Casey recently resigned from the Seiberling Latex Products Co., Barberton, O., to accept the vice presidency of the New Bedford firm.

Washburn Wire Co. is erecting a gas generating building at its plant on Bourne Ave., Phillipsdale, East Providence, R. I., at an estimated cost of $20,000.

The Community Fund Drive of Providence, R. I., listed among its first contributions $2,500 from the Davol Rubber Co. and $1,070.10 from that firm's employes.

The Schavoir Rubber Co., Springdale, Conn., manufacturer of rubber toys and novelties, which went bankrupt, on October 9 was sold at public auction under the auspices of James J. Leon, federal auctioneer, 489 E. Main St., Bridgeport, Conn. For the convenience of bidders, the personal property was sold in piecemeal lots only and included machinery and equipment, raw materials, finished goods, and miscellaneous material.

OHIO

Forest City Rubber Elects

The Forest City Rubber Co., 1272-76 Ontario St., Cleveland, O., at its recent meeting of the board of directors named as president William E. Crofut, Jr., succeeding his late father, founder of the company. At the same time the directorate of the Canadian subsidiary, Comfort Products, Ltd., 119 Pearl St., Toronto, Ont., elected Mr. Crofut, Jr., its head.

The parent concern, which makes Cro*-Pax Foot Aids and Sentinel First Aids, distributed in 5 and 10¢ stores throughout the country, and has conducted a mechanical rubber goods business for 35 years, operates factories in Cleveland, Mansfield, O., and Toronto, has an assembly unit in Nottingham, England, and a branch office at 15 E. 26th St., New York, N. Y. In recent months Cleveland manufacturing operations have been substantially expanded with a new factory and warehouse space comprising about 50,000 square feet. The company's export business, even though handicapped by the cut-off of European trade, now shows consistent increases through improved South American distribution.

E. W. Ebert is secretary of the company, and H. B. Lawyer comptroller.

The Cleveland Liner & Mfg. Co., 5508 Maurice Ave., Cleveland, recently elected Ervin C. Pope vice president. He has taken over the sales work of the late Edward A. Pope and is just starting out to meet the trade.

The Seiberling Rubber Co., Akron, has received a contract from the White Motor Co. to supply Bullet Seal Tubes and Mud and Snow Tires for vehicles for the United States Army. Totaling more than $500,000, the award is one of the largest single orders ever received by Seiberling. In making this announcement President J. Penfield Seiberling pointed out that it comes at the time of year when replacement tire production normally is at low ebb. For that reason, while the contract will afford steadier employment for Seiberling workers, no particular personnel or plant expansion will be necessary.

F. A. Seiberling, dean of the rubber industry and chairman of the board of the company bearing his name, on October 6 celebrated his eighty-first birthday. No formal celebration was held, but his friends and associates saw him and paid their respects. Although he relinquished his heavy executive duties nearly three years ago, Mr. Seiberling is at his desk almost daily serving in an active capacity.

The Firestone Tire & Rubber Co., Akron, O., has reported that its Gastonia, N. C., plant has had only one lost-time accident in the past 18 months; thus more than 1,800 employes have completed over a year and a half of continuous work in complete safety.

Collyer Discusses the Synthetic Rubber Question

John L. Collyer, president of The B. F. Goodrich Co., Akron, on October 8 addressed the Sales Executive Club at the Hotel Roosevelt, New York, N. Y., at its regular weekly luncheon-meeting, on the time element in the synthetic rubber situation, reiterating his views expressed at a recent hearing before the Senate Military Affairs Committee. He declared 18 months were needed to engineer, construct, and start operations of a 35,000-ton plant, the most efficient size of unit, for making synthetic rubber, at a cost of about 25¢ a pound, contrasted with 50 to 60¢ in Goodrich's present plant having a daily capacity of six tons. With priorities of necessary materials and machinery, at least three years would be required to provide enough plant capacity to produce the synthetic rubber needed instead of natural to fill the nation's tire demands.

The price of natural rubber, about 20¢ a pound, is an artificial one maintained by an international control agreement, Mr. Collyer holds, in view of an estimated annual world productive capacity of 1,600,000 tons and a consumption averaging a million tons. Because of the enormous and growing capacity of Far Eastern plantations and the artificial price of rubber, only "standby" plants could be justified from an economic standpoint, and competition should be a prime factor in the government's plan to create such essential standby facilities.

Reviewing the steps taken by the government to assure an adequate reserve of crude rubber, Mr. Collyer stated that two-thirds of the 87,000 tons of rubber in the cotton-rubber barter agreement with Great Britain had already been received, with the remainder afloat. At present the United States has four months' supply here, three months' afloat, and three months' of finished goods on hand, totaling 10 months' supply, which by the use of reclaim could be stretched to one year's supply. By a rigid rationing a few more months of grace would result, although such a policy would seriously affect employment in the rubber, automobile, and allied industries, which now claim one-seventh of the nation's workers. Regarding the agreement between the Rubber Reserve Co. and the International Rubber Regulation Committee to purchase 330,000 tons of reserve rubber, Mr. Collyer believes delivery should be completed within 15 or 18 months if nothing interrupts production.

Mr. Collyer does not think South America could provide a satisfactory source of rubber for ten years at least. Leaf disease, for one thing, is a deterrent in South America.

Thus he feels that in synthetic rubber lies the solution of this problem—especially its use in tires which comprises 75% of the nation's rubber consumption. In this connection the speaker mentioned the sympathetic reception by the public of Goodrich's Ameripol tires even though the price was higher because of the cost of the synthetic from which they are made.

Mr. Collyer has announced the appointment, effective October 15, of Frank T. Tucker as director of advertising, succeeding P. C. Handerson, in the post since 1931, who resigned last month to engage in general advertising work. Mr. Tucker, an alumnus of the University of Wisconsin (1918), joined Goodrich in 1919 and has held various sales and advertising positions both in the field and in the company's Akron organization. From 1929 to 1932 he was in charge of advertising for Goodrich Silvertown Stores, and from 1932 until his new appointment was manager of the Goodrich company's tire advertising.

Goodyear Tire & Rubber Co., Inc., Akron, has announced that Vice President J. M. Linforth, besides being in charge of original equipment sales, will take over the direction and coordination of activities relative to government sales. V. R. Jacobs and his organization will report directly to Mr. Linforth; while T. Calloway, assistant manager of manufacturers sales, Chicago, Ill., will return to Akron to assist the vice president on original equipment business.

R. E. Long recently has assumed his duties as general manager of Eagle Rubber Co., Inc., manufacturer of rubber toys and specialties, Ashland. He had previously been purchasing agent for the Seiberling Latex Products Co., Barberton, which he had joined nearly 12 years ago following his graduation from Stanford University. Eagle Rubber Co., Inc., is a reorganization of the Eagle Rubber Co. (August 14, 1939).

Ralph L. Dickey recently was elected president and general manager of the Kelley Island Lime & Transport Co., Cleveland. Mr. Dickey was with the United States Rubber Co. from 1928 to 1937, during which time he was associated with the General Products Division, Providence, R. I., and later was manager of the New Products Department in New York, N. Y.

Bolivia Interested in Rubber Development Plan

An official communique from Edmundo Vasquez, Minister of the Treasury, La Paz, Bolivia, states that he has "seen with the utmost interest and sympathy a proposition submitted by the United States Minister regarding an investigation of rubber production in our country for the establishment of possibilities of exportation on a great scale." It is expected that Bolivia, one of the countries included in the survey planned by the United States Department of Agriculture on rubber growing in the Western Hemisphere,[1] will cooperate in an effort to recapture the rubber export markets lost more than three decades ago with the expansion of rubber plantations in the Far East.

[1] See India Rubber World, Sept. 1, 1940, p. 56, for full details.

CANADA

Dominion Department of Munitions and Supply, Ottawa, Ont., in its recent listings of contracts awarded includes: *mechanical transport equipment,* Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., $33,664; Goodyear Tire & Rubber Co., Ltd., New Toronto, $71,093; *clothing,* Miner Rubber Co., Ltd., Granby, P. Q., $9,595, British Rubber Co. of Canada, Ltd., Montreal, P. Q., $16,380, Dominion Rubber Co., Ltd., Montreal, $22,115, Dominion Rubber, Ottawa, $12,775, Kaufman Rubber Co., Ltd., Ottawa, $6,948, Kaufman Rubber, Kitchener, Ont., $7,575, Northern Rubber Co., Ltd., Guelph, Ont., $17,871; *personal equipment,* Dominion Rubber, Ottawa, $18,750, B. F. Goodrich Rubber Co. of Canada, Ltd., Kitchener, $24,902; *land transport equipment,* Dominion Rubber, Ottawa, $6,702; *aircraft equipment,* Dunlop, $12,954, Goodyear, $20,865, Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., $7,312, Goodrich, $6,176.

National Tent & Awning Co., Ltd., 251 Sorauren Ave., Toronto, Ont., has announced the amalgamation of Dyers & Rubberizers, Ltd., and National Tent & Awning Co., Ltd., with business being conducted by the latter concern under the same personnel as heretofore.

Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., has appointed Norman S. Grace chief chemist to succeed L. D. Carver, resigned. Before joining Dunlop a year and a half ago, Dr. Grace was with Gutta Percha & Rubber, Ltd., Toronto, and prior to that with the National Research Council. An alumnus of the University of Saskatchewan (1927), he did post-graduate work at the Royal College of Science (London) and the universities of California and Toronto.

Dr. Norman S. Grace

Goodyear Tire & Rubber Co., Ltd., New Toronto, Ont., in a letter, signed by President A. G. Partridge, accompanying dividend payments, stated sales for the first nine months of 1940 were "substantially larger than during the same period in 1939, in spite of the fact that export sales have been considerably reduced, due to transportation difficulties and exchange restrictions caused by the war. However, the loss in export business has been counterbalanced to a large degree by increased domestic sales and orders for war requirements received from both the British and the Canadian government. . . . An important proportion of the tires required for Army service cars and trucks, gun-towing vehicles, ambulances, field artillery and airplanes, is being supplied by your company, in addition to substantial quantities of mechanical rubber goods ordered by the War Department. The margin of profit on such orders is, as it should be, very small, and this fact, together with heavier taxation, as well as higher production costs, due for the most part to increased market prices of raw materials, will not permit us to show the usual percentage of profit for the year to date, which your company's increased business would ordinarily indicate."

Goodyear of Canada recently completed what is believed to be the largest single conveyer belt ever built. This order was 887 feet long, 54 inches wide, built 10-ply with a breaker all around, weighed 27,860 pounds, and was 11½ feet high when rolled up. It was destined for a mining concern.

Early Experience with Low-Pressure Tires

The September, 1940, issue of *Canadian Chemistry and Process Industries* contains a story, "Historical Note on 'Grip Ground' Tires," that relates an incident which occurred with low-pressure tires long before their general use. The late Harold van der Linde, of Toronto, noted rubber technologist, chemist, and process inventor, and M. L. Allard, now with U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y., participated. The latter, in 1912, was taking a picture of two "Grip Ground" tires, designed and manufactured under the direction of Mr. van der Linde and placed on the rear wheels of his automobile. An interested spectator was Skerns, the van der Linde chauffeur, who had previously been coachman in the family. He noted that when the new tires were mounted and inflated, the car was not level because the regular high-pressure tires were still on the front wheels. Skerns, feeling that all was not well, asked his master if he intended to run the car as it was thus equipped. The answer was in the affirmative.

Then the chauffeur declared, "I fear that with those lower tires on the back wheels our speed will be reduced and the consumption of gasoline will be increased."

Upon being asked how he arrived at such a conclusion, Skerns replied, "We will be going up-hill all the time, Sir."

Canadian rubber manufacturers recently were reported to have been operating on heavy schedules, with tire, belting, hose, packing, and other mechanical goods producers on a 24-hour basis and rubber-shoe plants on normal day schedules.

European refugees, astonished at the number of automobiles and bicycles in Canadian cities and the fact that there is no scarcity of rubber or gasoline, find a contrast with conditions in Germany, where, they say, to prevent waste of rubber tires, children owning bicycles are permitted to use them only for riding to and from school, and violations are punished by confiscation of tires.

Dominion Rubber Co., Ltd., Montreal, P. Q., subscribed $370 to the Canadian Red Cross Drive and $100,000 to Canada's recent $300,000,000 War Loan.

FINANCIAL

Unless otherwise stated, the results of operations of the following companies are after deductions for operating expenses, normal federal income taxes, depreciation, and other charges, but before provision for federal surtax on undistributed earnings. Most of the figures are subject to final adjustments.

Anaconda Wire & Cable Co., New York, N. Y. June quarter: net income, $367,979, equal to 87¢ each on 421,981 shares of common stock, against $131,293, or 31¢ a share in the June quarter, 1939.

Armstrong Cork Co., Lancaster, Pa. First half, 1940: net income, $2,114,655, equal to $1.42 a common share, against $1,520,153, or $1 a share, in the same period last year.

Belden Mfg. Co., Chicago, Ill. First half, 1940: net income, $167,324, against $166,639 income last year, including $73,747 cash value on books; net sales billed, $2,760,431, against $2,214,504.

Canada Wire & Cable Co., Ltd., Leaside, Ont. First half, 1940: net income, $380,000, equal, after preferred and Class A dividend requirements, to $1.51 each on 150,662 shares of Class B common stock, against $154,838, or 21¢ each on Class B stock, last year.

Corduroy Rubber Co., Grand Rapids, Mich. For 1939: net income, $233,233, equal, after preferred dividend requirements, to $3.76 a share on 28,400 common shares, against $195,025, or $2.83 a share on 28,469 common shares, in 1938.

Crown Cork & Seal Co., Inc., Baltimore, Md., and wholly owned domestic subsidiaries. First half, 1940: net profit, $1,318,188, equal, after all charges and preferred dividend requirements, to $2.06 each on the 517,609 common shares outstanding, against $795,895, or $1.05 a common share, in the first six months last year; net sales, $15,968,483, against $13,088,229.

Dow Chemical Co., Midland, Mich., and subsidiaries. Quarter ended August 31: net profit, $2,105,946, after interest, depreciation, federal income taxes, and other charges, equal, after preferred dividend requirements, to $1.96 each on 1,031,988 common shares, against $1,449,524, or $1.33 a share, in the corresponding period last year.

Faultless Rubber Co., Ashland, O. Year to June 30: net profit, $137,621, equal to $2.10 a share on 65,450 shares of no-par capital stock, against $70,324, or $1.07 a share, in the year before.

Garlock Packing Co., Palmyra, N. Y. First half, 1940: net profit, $528,523, equal to $2.52 a share, against $364,133, or $1.74 a share, in the first half of 1939.

General Cable Corp., New York, N. Y. June quarter: net profit, $768,156, equal, after dividend requirements on 150,000 shares of 7% preferred stock on which is an accumulation of unpaid dividends and dividend requirements on 310,339 shares of $4 Class A stock, to 29¢ each on 664,558 shares of no-par common stock, compared with $727,425, or 23¢ a common share in the March quarter and with $26,494, or 17¢ a share on 7% preferred stock in the June quarter of 1939. Six months to June 30: net profit, $1,495,581, or 52¢ a common share, against net loss last year of $170,279.

General Electric Co., Schenectady, N. Y. Nine months ended September 30: net profit, $37,094,776, available for dividends after provision for federal income and excise-profits taxes, equal to $1.29 a common share, against $25,022,631, or 87¢ a common share, in the corresponding period of 1939; net sales, $287,249,930, against $217,900,154.

L. H. Gilmer Co., Philadelphia, Pa. First half, 1940: net income, $53,595, or 65¢ a share on 82,824 shares, against $46,891, or 57¢ a share last year; net sales, $713,655, against $634,580.

Philadelphia Insulated Wire Co., Philadelphia, Pa. First half, 1940: net loss, $19,037, against $46,740 in the first half of 1939.

Raybestos-Manhattan, Inc., Passaic, N. J. First half, 1940: net income, $919,158.91, or $1.46 per share, after providing for depreciation and taxes. The profits of the wholly owned Canadian subsidiary have not been included; they had no material effect on the consolidated statement of the company and will be in the annual statement.

FROM OUR COLUMNS

50 Years Ago—November, 1890

The most uncertain business in the wide world is the manufacture of rubber goods. It is better first to experiment and know exactly what your gum will do before taking it for granted that rubber is rubber, and that all rubbers can be used exactly alike. (p. 36)

From the results of an experiment to determine the destructive action of copper on rubber, it would seem that pure metallic copper exerts a powerful oxidizing effect on the rubber. Curiously enough, it was found that rubber hardened by copper contained no appreciable trace of copper, showing that there was no combination of the two substances. (p. 37)

A patent has recently been taken out by Mr. Edison for a fireproof insulating covering for wires. The material used as a basis for the compound is chlorinated balata or gutta percha. (p. 38)

I regret to see the manner in which the Secretary of Agriculture dismisses the suggestions for evolving a rubber plant adapted to the Southern United States. It is to be hoped that the Department of Agriculture will lend its assistance to further any efforts in this direction, and not condemn a project where predictions of failure are as yet merely based upon guessing. (From a letter to the Editor from Court Courtenay De Kalb.) (p. 39)

A new belt that has a decided advantage over the ordinary rubber belting, is that called the "No Seam Belt." It is made by the Boston Woven Hose Co., Boston, Mass. (p. 47)

25 Years Ago—November, 1915

A Scotch inventor (British patent 24,680) proposes to concentrate rubber latex for delivery to manufacturers. The evaporation of the latex is conducted either at atmospheric pressure or in vacuum. The concentrated latex, while hot, is placed in air-tight vessels for shipment and is in a form suitable for immediate use with or without the addition of water. (p. 64)

Dry distillation of cocoanut shells yields a crude acid of 10 to 12% strength, which can be used for coagulating rubber at a greatly reduced cost. (p. 91)

The fungus which causes the leaf diseases of the *Hevea Brasiliensis* was first described by Hennings in 1904, under the name of *Dothidella Ulci.* The specimens had been collected in the upper Amazon Valley, Acre Territory, and Peru. Later Dr. Huber stated that the disease sometimes caused serious damage and defoliated the trees. (p. 92)

Stauffer Chemicals

TIRE BRAND
Commercial Rubbermakers' Sulphur, 99½% Pure

TUBE BRAND
Refined Rubbermakers' Sulphur, 100% Pure

CRYSTEX (INSOLUBLE) SULPHUR

SULPHUR CHLORIDE

CAUSTIC SODA

CARBON BISULPHIDE

CARBON TETRACHLORIDE

STAUFFER CHEMICAL CO
420 LEXINGTON AVE., NEW YORK, N. Y.
230 NO. MICH. AVE., CHICAGO, ILL.
624 CALIFORNIA ST., SAN FRANCISCO, CAL.
555 SO. FLOWER ST., LOS ANGELES, CAL.
424 OHIO BUILDING, AKRON, OHIO
FREEPORT, TEXAS APOPKA, FLORIDA

EUROPE

GERMANY

The Manufacture of Vinidur Products

Films, sheets, plates, and piping made of the polyvinylchloride known as Igelit PCU and also marketed under the names Decelith and Mipolam are now to be known as Vinidur products.

A review of the information on the thermoplast Vinidur indicates that it has a specific gravity of 1.38; it softens at 80° C., is non-inflammable and free of taste and odor. Up to plus 40° C. it resists water, all kinds of salt solutions, alkalies, muriatic acid in all concentrations, sulphuric acid up to 85%, nitric acid up to 55%, formic and acetic acids, mineral oils, benzine, alcohol, and carbon tetrachloride. On the other hand it does not withstand aromatic hydrocarbons (benzol, toluol, etc.) ether, esters, ketones, and the other hydrocarbon chlorides.

Vinidur is available in long lengths as films 0.2- to 0.6-millimeter thick, 600 to 700 millimeters wide, which come in rolls; in sheets 0.6- to 6-millimeters thick, 600 millimeters wide, and 1,400 millimeters long; and plates over 6 millimeters and up to 40 millimeters thick, of the dimensions 450 by 500 millimeters, and 550 by 1,450 millimeters. Plates up to 20 millimeters thick can also be obtained with the dimensions 1,000 by 2,000 millimeters, and over 20 millimeters thick, in dimensions of 600 by 600 millimeters.

Pipes are supplied ranging from three to 150 millimeters in diameter, and in lengths of three to four meters. Solid, round rods of five to 60 millimeters diameter, and hollow round rods of 18 to 60 millimeter diameters, and in lengths of two meters, are also made. All these products can be turned, drilled, cut, sawed, and milled. Speeds usual in working brass and light metals are suitable for Vinidur, though in most processes the cutting edges of the tools should be cooled during operations by a stream of compressed air. Sheets up to two millimeters thick can be cut with shears.

The material can also be worked up into different shapes by bending, drawing, stamping, or punching. When sheets are to be shaped by bending, a current of hot air of 200° C. is directed toward the part to be bent to soften it, or the entire piece can be heated through to 140 to 150° C. in a heating cabinet. Pipes that have to be curved are first tightly packed with sand, then heated, and bent to the desired form along a model or pattern on a level surface. If the pipes have a diameter of over 80 millimeters and have thick walls, the sand is first heated before filling is commenced. The most favorable temperature for forming pipes is about 130° C.

Vinidur piping is usually produced on tubing machines, but wider pipes cannot be made in this way. However the recent development of a method of welding thermoplasts, especially Vinidur, makes it possible to produce pipes of large diameter. This welding process employs a specially designed burner which directs a stream of air heated to 250° C. to the parts to be joined. In the case of Vinidur, a strip of the same material about three millimeters in diameter is used as the welding wire. The advantage of this method over cementing is that it is simpler, requires no prolonged drying period, while the edges can be joined without overlapping.

Vinidur sheet is much used for lining metal containers and large iron pipes. Here the surfaces to be treated are first carefully cleaned, preferably by sandblasting, and the metal receives three coats of the cementing solution PC 10. Each coat must be thoroughly dried before the next is applied, which takes about 12 hours in all. The container or pipe is carefully heated from the outside until the adhesive coat takes on a milky appearance, that is to about 130° C. The lining of Vinidur, which should be at least 0.7-millimeter thick, is first coated with PC 20 solution and dried, then applied to the prepared and heated surface of the vessel. The sheets of Vinidur must be applied carefully so as not to enclose any air; the seams are allowed to lap over about 50 millimeters, and the laps are cleaned with methylene chloride, again coated

with PC 20 solution, and sealed. The tightness of the lining must be tested by means of an induction coil, and any defective spots repaired with fresh pieces of Vinidur sheet applied as above. Containers of wood, concrete, or masonry can also be lined in this way.

When thermoplasts have to be stuck together, no special adhesive is necessary; it is sufficient to apply a pure solvent which produces local surface swelling and resultant stickiness. But Vinidur is an exception; it is insoluble in the usual organic solvents; so special cements have been developed for it. These are solutions of a plastic whose chemical composition is similar to that of Vinidur, but which is easily soluble in an organic solvent with low boiling point.

Vinidur has been found useful as a substitute for rubber, and certain metals in the chemical and also the food packing industries; however manufacturers emphasize that whatever its application, the fact that it softens at 80° C. must always be taken into account.

New Gasket Material

Since asbestos is among the materials of which there is a shortage in Germany, its use has been limited, and substitutes have had to be developed. Taking advantage of Buna's superior resistance to heat and oils and its tendency to stiffen at high temperatures instead of becoming soft like natural rubber, a new gasket material has been evolved in which asbestos is not used. For this, three sheets of the synthetic rubber and two layers of steel wire netting are vulcanized together; the wires of the two metal layers are placed at angles of 45° to each other. The new gaskets are not coated with graphite, and this together with their elasticity, it seems, gives them better holding properties than the usual gaskets; while, in addition, they resist hot water and hot oil up to 350° F., and also glycol, gasoline, and leaded gasoline.

GREAT BRITAIN

Air Raids Boom Rubber Goods Sales

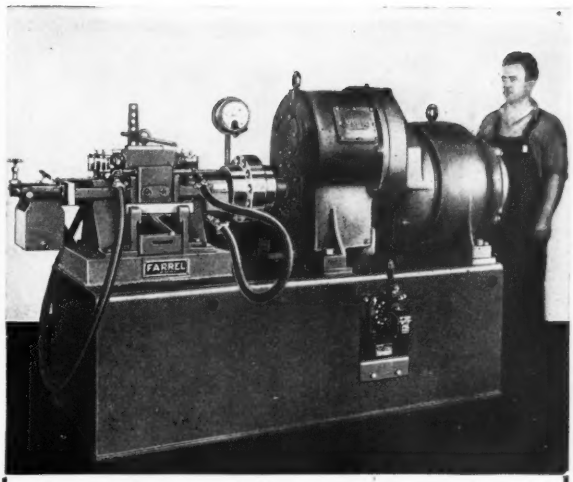
The constant air raids and blackouts have stimulated the demand for various kinds of rubber goods intended on the one hand to make blackouts more effective and, on the other, to make life in the air-raid shelters more bearable. As a result, there have been large sales of proofed fabrics for blackout purposes as well as airbeds, waterproofed sheeting, proofed sleeping bags, inflated cushions, and head-rests for air-raid shelters. With the approach of winter it is expected that the trade in the latter type of goods especially will increase still further. Protective garments, as waterproof overtrousers, coats, and slacks, are also in good demand by both men and women.

New Gaisman Block

Rubber Roadways, Ltd., in its report for 1939 states that an area of about 300 square yards on Duke St., St. Marylebone, is to be paved with Gaisman blocks having a new type of surface design. These are anti-skid blocks selected after very careful tests carried out by the Government Research Laboratory in Harmondsworth. The section paved with the new blocks, it is said, will not present the usual shiny surface when wet because the light is broken by the design of the blocks which also have, and will preserve, a dull finish. Furthermore the blocks have sharp arrises which will counteract and resist any tendency to skidding and which, it is claimed, will remain effective for many years even under heavy traffic conditions.

July Imports and Exports

Imports of crude rubber into Great Britain in July, 1940, were unusually high, representing a value of £2,299,700, against £1,197,000 for June, and £508,250 for July, 1939. The



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For laboratory use the Banbury is made in three sizes. The machine illustrated is the standard Size B, equipped with a four-speed motor, which permits the testing of the effects of four different speeds on different types of stock.

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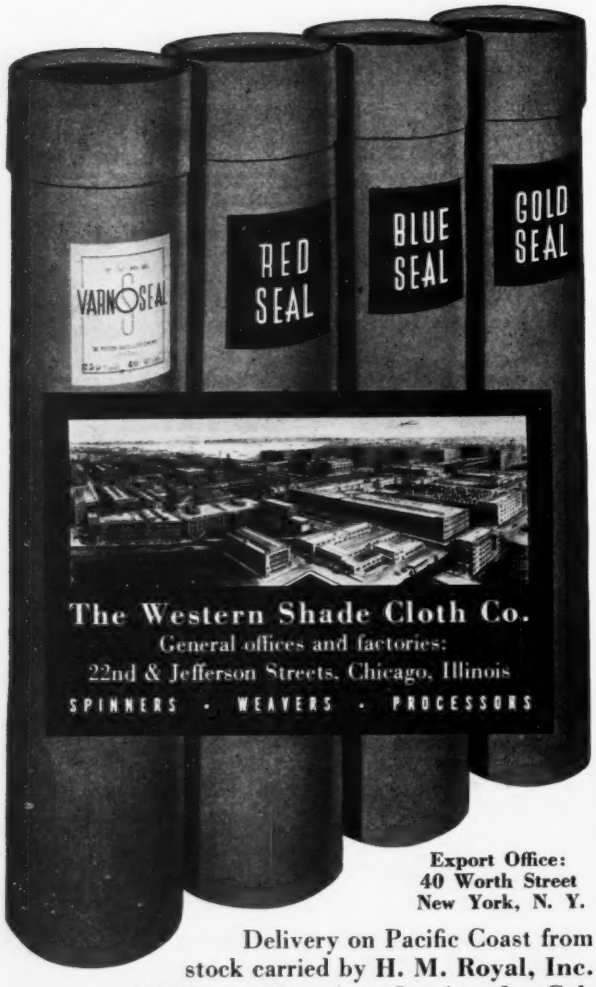

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total imports of raw rubber during the first seven months of 1940 were valued at £9,588,900, which is almost double the amount for the same period in 1939.

The loss of European markets for rubber manufacture is beginning to make itself felt. In July shipments had a value of only £116,150 as compared with £125,000 in June, and £134,000 in July, 1939. However the value of exports for the first seven months of this year is still considerably higher than for the corresponding period of 1939.

Notes

The Leyland & Birmingham Rubber Co. reported net profits of £118,734 for the year ended June 30, 1940, an increase of £19,601 over the preceding fiscal year. The company again declared total dividends of 12½%.

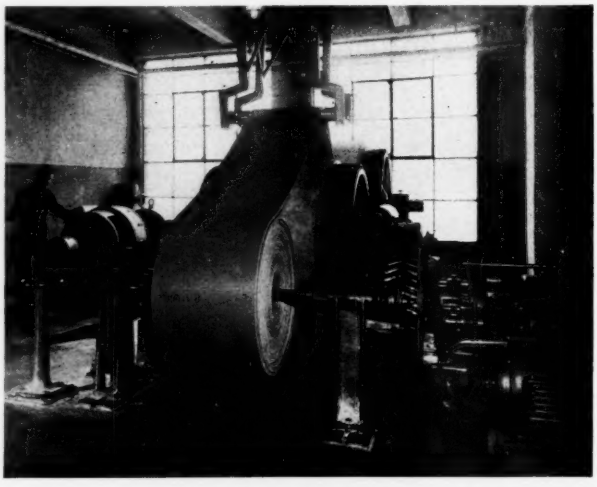
The Ministry of Supply has decided to regulate the consumption of plastics, so is setting up a Plastics Control, and has appointed A. Vyvyan Board controller of plastics.

Old tires, especially from private garages, are being collected by the salvage department of the Ministry of Supply. Those not too badly worn are to be retreaded and put back on the road; others are to be reserved for export, and still others, which cannot be reconditioned, are to be set aside for the reclaimers. A firm of retreaders has advised local authorities that old tires may be brought to them, when experts will sort and grade the tires which will then be disposed of to the best advantage of the country.

Machine for Vulcanizing Belting Used in Norway

The vulcanizer essentially consists of two drums of 150 cm. diameter. A steel band of the appropriate width is wound around the first drum, and a non-conducting layer is inserted. This band is electrically preheated to the temperature required for vulcanization and, then, together with the rubber belt to be cured, is wound around the second drum, the band being under tension (about 10,000 kilograms). By regulating the electrical current the necessary curing temperature can be accurately controlled. Because the heating body is comparatively small in relation to the mass to be vulcanized and also because it is rolled up with the belt, the heat developed during vulcanization, instead of being lost as when belts are cured in a press, is retained and utilized so that current can be considerably reduced as soon as the temperature is reached at which vulcanization sets in.

With this machine belt areas of about 100 square meters can be vulcanized with perfect uniformity in a single operation; the entire process, including preheating the band, rolling band and belt, vulcanizing and unrolling the finished belt, takes 75 to 90 minutes. An advantage of the process is that the belts are cured while in a curved state so that the bending strain is up to 50% less as compared with flat cured belts.



Electrically Heated Vulcanizer for Long Belts

FAR EAST

NETHERLAND INDIA

Conductivity of Latex

A preliminary investigation to determine to what extent conductivity measurements of latex can be used as an aid in examining latex was undertaken by G. E. van Gils[1] at the West Java Experiment Station, Buitenzorg. The conductivity measurements were, for the most part, made with a new apparatus developed by the Philips concern and known as the Philoscope. It was found that the conductivity of latex increases continuously during storage. However, in the case of properly ammoniated latex, the increase in conductivity is most marked in the first two days after tapping; thereafter the increase is considerably smaller and continues to diminish, although sudden spurts may occur. If insufficient ammonia has been added to the latex, conductivity increases rapidly from day to day until finally the latex coagulates. The slow, continuous rise in conductivity is held to be due to some chemical action as hydrolysis.

The D.R.C. was found to have a great influence on conductivity. This is tentatively explained by the assumption that the serum is the only medium capable of transmitting electricity, but indications are other factors must be involved.

Ammonia greatly affects the conductivity of dialyzed latex. As a result of a comparison of the respective conductivities of ammoniated latex, of ammonia alone, and of latex alone, it was concluded that a great deal of ammonia must be adsorbed on the latex particles. Conductivity measurements also showed that when salts are added to dialyzed latex, a part of the salts is adsorbed by the rubber globules; such adsorption is especially marked in the case of the divalent ion calcium. From this it appears that the adsorption of electrolytes on the rubber particles can be very readily followed by means of conductivity measurements.

These findings led to the supposition that adsorption depends on the charge of the latex particles (that is, on the pH of the medium), and that if the charge was low, adsorption would be low, too. From this it was further deduced that latex coagulated with acid would yield rubber with a lower ash content than latex coagulated by heat or alcohol, for instance. Subsequent tests confirmed these suppositions.

Determination of Viscosity of Latex

In "Some Observations on the Determination of the Viscosity of Latex by Means of a Capillary Viscosimeter," G. E. van Gils,[2] criticizes a paper by H. F. Jordan, P. D. Brass, and C. P. Roe[3] on the subject. He begins by explaining the theoretical basis of viscosity determinations and shows that Poisseuille's formula can be derived in the case of a true liquid or Newtonian liquid flowing through a capillary tube. But, he points out, when dealing with a non-Newtonian liquid (like latex, and more particularly concentrated latex) it is not permissible to use any formula based on the law of Poisseuille. At a certain point in their calculations, however, the above authors do make use of Poisseuille's formula, and this is the object of van Gil's criticism. He adds in the English summary of his article:

"The Crude Rubber Committee has realized very well the importance of uniformity in viscosity determinations, but we must warn very severely against methods grounded on a wrong basis."

Van Gils also quotes from a paper by B. M. Kendrow, "Formula for Determining Viscosity of Latex,"[4] to show that some fundamental errors have been made by the author so that his formula is not acceptable.

[1] "Preliminary Investigations on the Conductivity of Latex." G. E. van Gils. *Arch. Rubbercultuur*, 24, 5, 413-30 (1940).
[2] *Arch. Rubbercultuur*, 24, 5, 403-12 (1940).
[3] "Examination of Rubber Latex and Rubber Latex Compounds. I. Physical Testing Methods." *Ind. Eng. Chem. (Anal. Ed.)*. 9, 182 (1937).
[4] *India Rubber J.*, June, 1939, p. 746.

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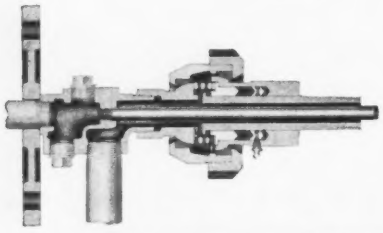

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Exports of Crude Rubber

Revised figures of crude rubber shipments from Netherland India in July, 1940, total 60,528 tons, of which 33,351 tons were estate rubber and 27,177 tons were native rubber. The preliminary figures for estate rubber show more than 13,000 tons less exported than the above, corrected amount.

According to available statistics, shipments in August, considerably lower than those of July, were 21,959 tons of estate rubber and 23,171 tons native rubber, in all 45,130 tons.

MALAYA

Food before Rubber

Malaya is, to a great extent, dependent on imports for its food supplies, especially rice for the large coolie population. For some time the feeling has existed that under present conditions the question of increasing locally-grown foodstuffs must be properly faced and that, as it has the land and the labor and relies to such an extent on imported rice for its employes, the rubber industry in particular should take the necessary steps in this direction. As the *Straits Times* put it recently, food should be considered before rubber.

It is recognized that the majority of rubber producers would never plant food crops voluntarily; therefore, the tendency is growing to agree with the above-named paper in its view that because of the urgency of the matter, the government should adopt compulsory measures to force rubber estates to grow foodstuffs on a part of their land. Many estates have reserve land that at present cannot, under the terms of the International Rubber Regulation Agreement, be planted up with rubber in any case; so such a ruling should offer no special difficulty to them. Others would have to postpone replanting schemes or resort to planting food crops between the lines of rubber trees. In this connection it may be pointed out that a large number of rubber estates in Java have always interplanted other crops with their rubber although there, of course, the idea was to avoid the risks incurred by putting all eggs in one basket, so to speak.

While there is a strong opinion in favor of compulsory food planting, by rubber growers, it is also realized that estates should not be expected to bear all the costs involved themselves, and it is being suggested that government should offer them a subsidy.

Baling Rubber

The perennial problem of finding the most satisfactory method of putting up rubber for export has been brought to the fore again by the war. The shutting off of European sources for plywood cases has considerably raised the prices of other imported cases as well as of those locally produced. It has been calculated that the increase of present prices of cases as against pre-war prices adds from 0.6 to one cent per pound to the cost of producing rubber.

The Rubber Research Institute of Malaya, having pondered this matter, proposes to reduce costs by baling rubber instead of packing it in cases. The Institute sees a good future for baling in rubber wrappers and in its *Planters' Bulletin* No. 12 especially refers to the method of packing in rubber bales adopted by Malayan American Plantations, Ltd., and by the H.A.P.M., of Sumatra, as described in the paper by D. E. Andrews, in India Rubber World of March, 1940. The Rubber Research Institute is now working on the problem of modifying and simplifying the above method, which is designed to cope with large outputs, so as to make it suitable for average-size estates also. To this end a press is being installed at the Institute's experiment station for further investigation. It is hoped to devise a system in which a hand-operated press can be used and the cutting of the rubber avoided. It will also be attempted to devise means for releasing the pressure from the baling box without returning it to the press a second time and to improve the method of coating the inside of the outer wrappers so that additional talc during stowing and warehouse handling will not be necessary.

Editor's Book Table

NEW PUBLICATIONS

"Cabot Carbon Black Grading for Rubber." Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass. 16 pages. There are nine grades of Spheron carbon black varying in degree of hardness. In this booklet the nine grades are evaluated in a standard rubber formula, and the characteristics imparted to the rubber are shown graphically. The properties covered are: abrasion, rebound, plasticity, flexing characteristics, nigrometer reading, volatile matter, D. P. G. absorption, rebound, and tensile strength.

"Camelback—Goodrich Die Specifications, Curing Schedules." The B. F. Goodrich Co., Akron, O. 12 pages. This booklet for the tire retreading and recapping trade briefly describes the firm's camelback and shows die sizes and curing schedules for this material.

"Lastex" Chart and Booklets. United States Rubber Co., 1230 Sixth Ave., New York, N. Y. A comprehensive wall chart depicts the manufacture of "Lastex" yarn from latex to "Lactron" (uncovered rubber thread), and thence to silk-, cotton-, and rayon-covered "Lastex" yarn. A number of different types of "Lastex" fabrics are attached to the chart with illustrations to show their application. Additional swatches of fabric and booklets are available to teachers and students desiring information about this yarn.

"Flamenol Insulated Cable." General Electric Co., Schenectady, N. Y. 4 pages. Flamenol synthetic-insulated wire, its properties and applications, are dealt with in this illustrated catalog section, GEA-2733D, which reveals that from early 1935 until the close of 1939 approximately 45,000,000 feet of Flamenol insulated wire and cable had been produced.

"Hewitt Rubber Products for the Oil Marketing Industry." Hewitt Rubber Corp., Buffalo, N. Y. 12 pages. This catalog covers the firm's products for the oil marketing industry—hose of the following types: suction and discharge, sea loading, tank truck, tank car filling and unloading, fuel oil, propane-butane, curb pump, vacuum brake, water, and air.

"Goodyear Rims for Trucks, Trailers, Buses, Farm Tractors, Farm Implements, and Contractors' Equipment." 32 pages. This is the firm's 1940 rim guide book which details important application features for rims manufactured by Goodyear. Photographs, diagrams, specifications, and helpful information for the user are included.

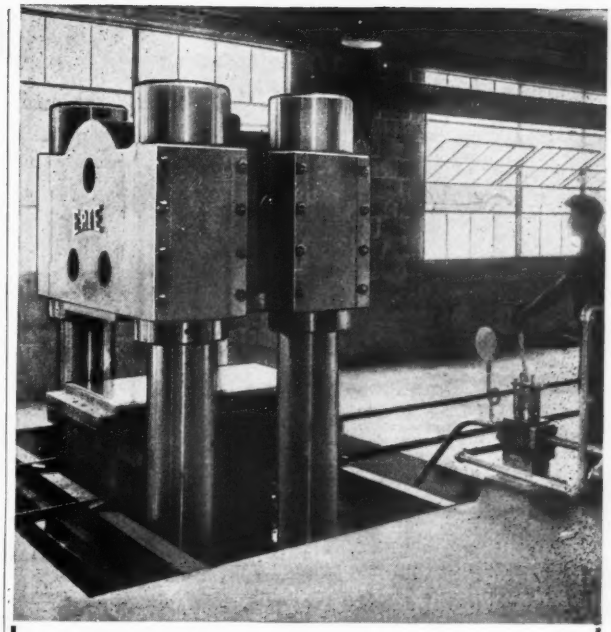
"Government and Economic Life," by Leverett S. Lyon and Victor Abramson. The Brookings Institution, Washington, D. C. 66 pages. This pamphlet is an interpretative summary of a two-volume study of the same name, which purports to show the proper relation of government to economic life and how great national emergencies have permanently affected this relation.

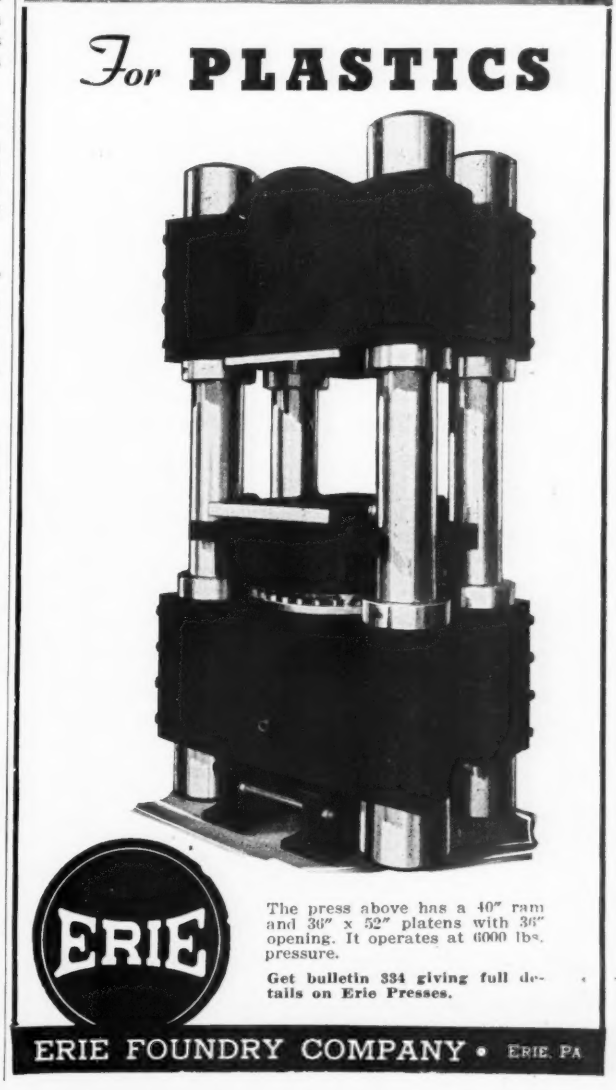
Bristol Bulletins. The Bristol Co., Waterbury, Conn.

"An Introduction to Bristol's System of Coordinated Process Control." Bulletin No. 512. 12 pages. This booklet, directed to industrial-plant executives, is composed chiefly of questions and answers, together with descriptive matter that represents a few of the problems solved by the firm's system of coordinated process control.

"Bristol's Valve Positioner." Bulletin No. 535. 4 pages. This leaflet describes a valve positioner, a pneumatic mechanism, said to position the disk of a diaphragm control valve at the exact point called for by the control instrument, regardless of valve friction.

"The Evolution of Automatic Process-Cycle Controllers for Industrial Plant Processes." Highlights of the Bristol instruments for automatic process-cycle control are presented in this folder, together with application photographs.

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"Glycols." Chemical Group Folder No. 2. Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York, N. Y. In this folder ethylene glycol, several polyethylene glycols, propylene glycol, and dipropylene glycol are described, and a table of reference data on commonly used physical constants of these glycols is given. Glycols, which have many other applications, find use as solvents and plasticizers and for producing synthetic resins, plasticizers, and emulsifiers.

"Pneumix Air Motored Agitators." Eclipse Air Brush Co., Inc., 390 Park Ave., Newark, N. J. 4 pages. Pneumix agitators, described in this folder, are propeller-type mixers which operate by air motor. Variable speeds from 30 to 6,000 r.p.m. are obtainable through regulation by an air throttle. As the air motor is sparkproof, the agitators are said to be safe to use in connection with most flammable materials.

"Meehanite—The Metal for Machine Tool Castings." Bulletin No. 9. Meehanite Research Institute of America, Inc., Pittsburgh, Pa. 16 pages. A previous edition of this booklet has been re-edited, and descriptions of a variety of additional applications of Meehanite castings in the machine tool industry are illustrated and described. A summary of the engineering properties of Meehanite is included.

"Don't Dump Dollars down Sewers—Save Them with the Link-Belt 'Liquid' Vibrating Screen." Folder No. 1877. Link-Belt Co., 2045 W. Hunting Park Ave., Philadelphia, Pa. 4 pages. The constructional and operational features of the firm's vibrating screens are briefly presented in this folder, together with several illustrations of industrial applications. Included is an illustration which shows the reclamation of fine rubber from sludge.

"Productivity, Wages, and National Income." The Brookings Institution, Washington, D. C. 22 pages. This pamphlet is a digest of a previously published study on productivity, wages, and national income. This study had two primary purposes: to determine the extent to which man-hour productivity has increased in the past 20 years and to ascertain how the resulting gains have been divided among labor, capital, and the general public.

"Rubber Black Testing Procedures." Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass. 20 pages. This manual sets forth in simple and condensed form an illustrated description of the tests used in the firm's laboratory to evaluate carbon blacks for use in rubber.

"Industry's Challenge to Research." Bert H. White, vice president, Liberty Bank of Buffalo, Buffalo, N. Y. 48 pages. This is a check list of industrial wants that need to be filled today and is based on 1,042 answers, received from America's industrial leaders, to the question, "What new product, process, or material might industrial research develop that would be valuable to your industry?" The survey, conducted by The Research Advisory Service, contains a number of items checked as most urgent from the standpoint of national defense. The items are arranged and classified according to industry. Under the heading, Rubber, there are 12 items, concerning: synthetic rubber, rubber in highway construction, powdered rubber, rubber flooring, tires for road building equipment, reclaiming, and reenforcers. Other sections throughout the booklet deal with problems that relate to rubber or that might be solved by the rubber technologist. Copies will be supplied to manufacturers who make their request on their letterhead, as long as the supply lasts.

"Directory of New England Manufacturers." 1941 Edition. Published by George D. Hall, Inc., 30 Kilby St., Boston, Mass., with the editorial cooperation of the New England Council, 764 pages. Price $20. This source of information on the manufacturing industries of New England lists manufacturers regardless of size; presents a comprehensive list of products and tells who makes them; gives commodities produced, the size and personnel of the various companies; and locates sources of supply geographically, as well as by product. The 1941 edition incorporates 17,700 changes in information which have taken place since the 1940 edition was printed.

"Fire!—Its Cause—Prevention—and Control." Harold J. Davis, 3927 E. Admiral Pl., Tulsa, Okla. Price 25¢. 24 pages. In writing this brief treatise, the author has as his purpose the familiarization of those responsible for industrial safety with the subject of fire. The booklet covers principles of combustion, volatile liquids, spontaneous ignition, principles of extinguishing fire, classification of fires, successful extinguishing agents, and suggestions for fireproof construction.

BOOK REVIEWS

"Chemical Industries, 1940." Edited by D. M. Newitt. Published by Leonard Hill, Ltd., London, England. Distributed by Chemical Publishing Co., Inc., 148 Lafayette St., New York, N. Y. Boards, 8 by 10¾ inches, 447 pages. Price $4.

This annual British compilation of data and information related to the process industries in general follows previous editions and is divided into nine sections by means of a handy "thumb-index." The sections cover: materials of construction for the chemical industry; power plant and water treatment; chemical plant layout and processing equipment; materials handling; process control instruments and laboratory apparatus; raw materials and heavy chemicals; fine chemicals; mathematical and conversion tables; and a bibliography of technical books. Each division of the book except the last two includes a catalog section devoted chiefly to British firms.

"Rubber Producing Companies—1940." Compiled by the Mincing Lane Tea & Rubber Share Brokers' Association, Ltd., Mincing Lane, London, E.C.3, England. Published by *The Financial Times*, 72 Coleman St., London, E.C.2. Boards, 5¼ by 8 inches, 619 pages. Price 7s. 6d. net, or 8s. 1d. post free (abroad 8s. 1½d.).

Of the 550 crude rubber producing companies covered by this reference guide for investors, about 200 are shown in a new simplified style of compilation. The data include: date of registration, list of directors and secretaries, financial structure, acreage, profit and dividends, balance sheet summary, and other relevant information. Each company is described separately in alphabetical order.

"The Productivity of Labor in the Rubber Tire Manufacturing Industry." John Dean Gaffey. No. 472 in Studies in History, Economics and Public Law edited by the faculty of Political Science of Columbia University. Published by Columbia University Press, Morningside Heights, New York, N. Y. 1940. Cloth, 5⅞ by 8¾ inches, 204 pages. Index. Price $2.50.

Here is an opportunity for the tire industry to examine a detailed survey of its labor productivity as this relates to the technological and economic development of the industry. More specifically the purpose of the study is four-fold: (1) to measure changes in labor productivity in tire manufacture since 1914; (2) to analyze the conditions attending these changes and to appraise the more important factors responsible for them; (3) to describe the principal effects of these changes upon our economic society; and (4) to attempt a prediction of the probable future course of labor productivity in this industry. The statistical phase of the subject is not neglected, and 20 tables amplify the text. While limited to a single industry, the study should contribute to a general understanding of the conditions which affect our national economy.

"What Will Inflation and Devalution Mean to You?" D. G. Ferguson, B. H. Francis, E. C. Harwood, B. D. Manton, and their assistants. Published by American Institute for Economic Research, Cambridge, Mass. 1940. Paper, 6 by 9 inches, 144 pages. Price $1.

This book is directed to the individual in an effort to help him better understand his personal financial problems in relation to present economic trends. The first third of the book explains where money comes from, what inflation is, and how it can be measured. A second section is devoted to inflation's record and timing; while a final section explains how the individual may obtain partial protection against the effects of inflation.

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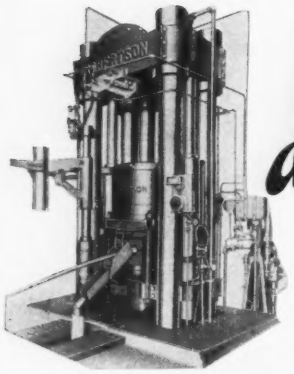

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Patents and Trade Marks

MACHINERY

United States

2,214,461. **Tire Patch Cutter.** A. R. Hendry, Portland, Mich.

2,214,825. **Tire Building Drum** with Pair of Collapsible Drum Heads. F. S. Sternad, Cuyahoga Falls, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,214,885. **Tire Groover.** O. L. Matchett, Portland, Oreg.

2,215,424. **Roll** for Rubber Mills, Etc. F. W. Klein, Deuz, Siegen, Germany.

2,215,435. **Apparatus to Subdivide Crude Rubber into Particle Form.** A. Hale, Akron, O.

2,216,985. **Deposition Form.** H. D. Rice, Barrington, R. I., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,216,995. **Deposition Form.** G. G. Wanless, Montreal, P. Q., Canada, assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,217,103. **Feed Hopper** for Mixing or Masticating Rubber and Like Material. R. T. Cooke, Sunningdale, assignor to Francis Shaw & Co., Ltd., Bradford, Manchester, both in England.

2,217,299. **Inflation Apparatus and Control Means Therefor.** M. L. Taylor, Hudson, O. assignor to B. F. Goodrich Co., New York, N. Y.

2,217,607. **Apparatus to Process Cord Tire Fabric.** M. G. Anderson and E. D. George, both of Cuyahoga Falls, O., assignors to Wingfoot Corp., Wilmington, Del.

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391,249. **Tire Shaping Apparatus.** Firestone Tire & Rubber Co., assignee of R. W. Brown and H. D. Stevens, co-inventors, all of Akron, O., U. S. A.

391,312. **Tire Spreader and Inspection Machine.** Bowes Seal Fast Corp., assignee of L. P. Fisher, both of Indianapolis, Ind., U. S. A.

391,533. **Continuous Vulcanizer.** C. J. H. Perry, North Quincy, co-inventor, and Boston Woven Hose & Rubber Co., Cambridge, assignee of W. J. Baker, Somerville, co-inventor, all in Mass., U. S. A.

United Kingdom

524,213. **Vulcanizers.** Dental Mfg. Co., Ltd., and W. G. Lee.

524,490. **Thread-Tensioning Arrangements in Winding Machines.** United States Rubber Co.

524,731. **Apparatus and Method for Drawing and Combing Textile Fibers.** Consolidated Rubber Manufacturers, Ltd.

524,743. **Molding Machines.** Armstrong Cork Co.

524,812. **Presses and Matrix-Opening Devices for Use Therewith.** Semperit Oesterreichisch-Amerikanische Gummiwerke A. G.

524,821. **Molds for Use in Vulcanizers,** Particularly for Retreading Tires. A. E. Lake.

525,117. **Vulcanizer.** D. Bridge & Co., Ltd., (National Rubber Machinery Co.).

525,121. **Tire Spreader and Inspection Machine.** L. P. Fisher.

PROCESS

United States

2,214,179. **Game Balls.** M. B. Reach, Springfield, Mass.

2,214,903. **Making an Inner Tube** by: Forming a Tube with One Thick and One Thin Ply; Shortening the Length of the Thin Ply as Compared to Thick Ply, Splicing the Ends of Tube; Distending the Tube; and Vulcanizing. H. C. Ickes, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,215,286. **Knitting Elastic Fabric.** R. E. Davis, Jr., Fort Payne, Ala., assignor to Interwoven Stocking Co., New Brunswick, N. J.

2,215,553. **Fiber-Rubber Products** from a Mixture of Latex, and an Aqueous Suspension of Wood Fibers in the Presence of a Condensation Product of a Straight Chain Aliphatic Alcohol with a Polyglycol Compound Which Stabilizes the Rubber at Room Temperature, but not at Elevated Temperatures. C. S. Johnson, Naugatuck, Conn., assignor to United States Rubber Co., New York, N. Y.

2,215,561. **Method of Latex Deposition,** Utilizing a Coating of Stabilized Uncoagulated Non-Acid Latex Containing a Non-Volatile Coagulant, Followed by Heat and a Second Coating of Latex, Coagulable by Coagulant in First Coating. S. R. Ogilby, Staten Island, assignor to United States Rubber Co., New York, both in N. Y.

2,215,562. **Latex Deposition** Comprising Dipping a Form in Heat-Gelling Latex Containing a Coagulant and "Emulphor-O," Gelling with Heat, and Dipping in a Latex Composition, Coagulable by Coagulant in Gelled Latex. S. R. Ogilby, Staten Island, assignor to United States Rubber Co., New York, both in N. Y.

2,215,563. **Coating Fabrics with Latex** by Application of a Heat-Gelling Latex Compound with a pH below 7 and Containing a Condensation Product of a Straight Chain Aliphatic Alcohol with a Polyglycol Compound. S. R. Ogilby, Staten Island, assignor to United States Rubber Co., New York, both in N. Y.

2,216,136. **Gas Impregnation for Expanded Rubber.** D. Roberts, assignor to Rubatex Products, Inc., both of New York, N. Y.

2,216,785. **Gas Expanded and Gas Retaining Latex Products.** D. D. Roberts, assignor to Rubatex Products, Inc., both of New York, N. Y.

2,216,834. **Making Sponge Rubber** from a Rubber Stock Containing a Gas Generating Material. J. H. Buskirk, assignor to Brown Rubber Co., Inc., both of La Fayette, Ind.

2,217,085. **Rubber-Impregnated Fibrous Packing Material.** H. T. Wheeler, Dallas, Tex.

2,217,137. **Making Floor Covering, Table Covering, Etc.,** by Uniting a Layer of Fabric and a Layer of Rubber. T. H. Roth and T. D. Hinchcliffe, both of Chicago, Ill.

2,217,605. **Production of Cellular Rubber Masses** by Aerating Latex Which Is Free of Foam Forming Agents, Adding a Gelling Agent, and Immediately Subjecting the Mixture to Temperatures above 100° C. to Cure the Mass. M. Carter, Trenton, N. J., assignor, by mesne assignments, to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

2,217,606. **Production of a Cellular Rubber Body** by Frothing Latex in Absence of a Foam Stabilizer or Foaming Agent, Adding a Vulcanizing Agent and Ammonium Sulphate, Adding Zinc Oxide, Gelling the Froth, and Vulcanizing. H. W. Greenup, assignor to Firestone Tire & Rubber Co., both of Akron, O.

Dominion of Canada

391,224. **Continuous Belting, Shaping and Vulcanizing Method.** Boston Woven Hose & Rubber Co., Cambridge, assignee of J. M. Bierer, Waban, both in Mass., U. S. A.

391,304. **Surface Treating Labeled Rubber Articles.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of T. H. Way, Montreal, P. Q.

391,517. **Gas-Expanded Closed-Cell Rubber Structures.** Rubatex Products, Inc., assignee of D. D. Roberts, both of New York, N. Y., and R. C. Bascom, Port Clinton, O., all in the U. S. A.

391,726. **Porous Elastic Fabric.** (Latex.) F. F. Schwartz, inventor, and M. A. Chavannes, assignee of one-half of the interest, both of Paris, France.

United Kingdom

523,893. **Wearing Apparel** Having the Property of Being Elastic. R. & W. H. Symington & Co., Ltd., F. G. Cox, and G. W. Billing.

524,019. **Pneumatic Tires.** Dunlop Rubber Co., Ltd., H. Willshaw, H. Smith, and F. G. Broadbent.

524,108. **Moisture-Proofing.** Wingfoot Corp.

524,632. **Method of Printing on Rubber.** Dunlop Rubber Co., Ltd., and F. Gillan.

CHEMICAL

United States

21,572. (Reissue.) **Synthetic Rubber Composition** of High Resistance to Swelling in Gasoline Including Polymerized Chloroprene and a Gasoline Insoluble Chlorinated Paraffin Wax. E. Ott, Elsmere, assignor to Hercules Powder Co., Wilmington, both in Del.

2,213,954. **Vulcanization Retarders** for Polymerized Halogen-2-Butadiene-1,3 Compositions—Maleic Acid, Maleic Anhydride, Phthalic Acid, Metallic Maleates, Metallic Phthalates, Etc. (Synthetic.) R. A. Crawford, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,214,460. **Accelerator**—Reaction Product of a Thiuram Disulphide and an Isocyclic Saturated Organic Amine. M. W. Harman, Nitro, W. Va., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,214,934. **Vulcanized Synthetic Rubber Compositions:** Polymerized Chloroprene Hydrosulphides; Polymerized Chloroprene Sulphides; and Polymerized Chloroprene Polysulphides. E. Ott, Elsmere, assignor to Hercules Powder Co., Wilmington, both in Del.

2,215,142. **Antioxidant**—Reaction Product of a Fatty Acid (8 to 18 Carbon Atoms) or a Fatty Acid Halide with a Polyhydroxy Benzene Compound. W. D. Wolfe, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

2,215,255. **Polymerization Inhibitors for Styrene**—Propane, Propylene, Isobutane, and Butylene. S. M. Stoesser and R. H. Boundy, assignors to Dow Chemical Co., all of Midland, Mich.

2,215,379. **Copolymers of Butadiene and Vinylidene Chloride** Prepared by Polymerizing a Mixture of Butadiene (50 to 65%) and Vinylidene Chloride. (Synthetic.) L. B. Sebrell, Silver Lake, O., assignor to Wingfoot Corp., Wilmington, Del.

2,215,382. **Rubber Softening Agent,** Comprising a Mixture of a Bituminous Material (Engler Viscosity, 2 to 12 at 213° F.) and a Saturated High Molecular Weight Fatty Acid, the Acid Serving as a Penetration Activator. A. E. Warner, assignor to C. P. Hall Co., both of Akron, O.

2,215,383. **Rubber Softening Agent,** Comprising a Mixture of a Bituminous Material (Engler Viscosity, 2 to 12 at 212° F.) and a Penetration Activator (Petroleum Product with Distillation Range of from 300° F. to 725° F.). A. E. Warner, assignor to C. P. Hall Co., both of Akron, O.

2,215,704. **Hardening Rubber** by Treatment with a Solution of an Alkali Metal Fluoride in Liquid Hydrogen Fluoride. E. C. Ladd, Highland Park, and N. J. Rakas, Royal Oak, assignors to Chrysler Corp., Highland Park, all in Mich.

2,216,044. **Sulphurized Polymers and Plastics**—

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Capable of Being Cured by Heat. (Synthetic.) J. C. Patrick, Morrisville, Pa., assignor to Thiokol Corp., Trenton, N. J.

2,216,094. **Comminuting a Styrene Copolymer** by Swelling to a Gel in a Solvent, Comminuting the Gel, and Precipitating the Copolymer as a Fine Powder with a Liquid Precipitant. (Synthetic.) E. C. Britton, Midland, Mich., H. B. Marshall, Toronto, Ont., Canada, and W. J. Le Fevre, assignors to Dow Chemical Co., both of Midland, Mich.

2,216,285. **Converting Normal Butene into Isobutene** by Subjecting Normal Butene to Isomerizing Conditions in the Presence of a Calcined Mixture of the Hydrogels of Silica, Alumina, and Thoria. (Synthetic.) C. L. Thomas and H. S. Bloch, assignors to Universal Oil Products Co., all of Chicago, Ill.

2,216,434. **Electrical Cable Coating Composition** Comprising 25 to 75% Rosin, 20 to 50% of Rosin Oil, and 5 to 25% of Polymerized Isobutylene. (Synthetic.) J. F. Eckel, Cranford, N. J., assignor to Western Electric Co., Inc., New York, N. Y.

2,216,461. **Rubbery Polyvinyl Acetal Resin Sheets** Containing the Ethyl Ether of Diethylene Glycol Succinate. (Synthetic.) H. B. Smith and D. R. Swan, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,216,524. **Antioxidant**—Mixture of a Diaryl p-Phenylene Diamine and a Reaction Product of an Aromatic Primary Amine and an Aliphatic Ketone. R. L. Sibley, Nitro, W. Va., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,216,958. **Emulsifying Agents** Used in Polymerization of Butadienes to Artificial Rubber—Products of the General Formula

$$X—CH_2—CH_2—Y—CH_2—CH_2—NZ$$

Where Y is Oxygen or Sulphur; NZ, a Secondary Amine or a Quarternary Ammonium Compound Radical; and X, a Radical of a Secondary Amine, an Acid Amide, an Ester, an Ether, a Quarternary Ammonium Compound, or a Hydroxyl Group. (Synthetic.) W. Pannwitz and B. Ritzenthaler, Ludwigshafen-on-the-Rhine, Germany, assignors, by mesne assignments, to Jasco, Inc., a corporation of Louisiana.

2,217,057. **Synthesizing Artificial Rubber** by Reacting and Polymerizing a Mixture of Butylene Hydrocarbons and Acetylene at Low Temperatures (below –80° C.) with Boron Trifluoride and Copper Chlorides. (Synthetic.) H. B. Kipper, Accord, Mass.

2,217,207. **Fungicidal Preparation** Containing a Diamino-Diaryl Methane of the Benzene Series. W. P Horst, Packanack Lake, N. J., assignor to United States Rubber Co., New York, N. Y.

2,217,632. **Vulcanizing Rubber** in the Presence of a Cyclohexylidene Aliphatic Amine. J. G. Lichty, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.

2,217,630. **Preparing Secondary Amines from Aldehydes.** C. F. Winans, Fairlawn, O., assignor to Wingfoot Corp., Wilmington, Del.

2,217,631. **Preparing Soft Synthetic Rubber-like Materials** by Polymerizing a Mixture of a

Butadiene and Vinyl Cyanide or Vinyl Benzene. (Synthetic.) W. D. Wolfe, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

2,217,632. **Preparation of Cyclonitriles** by Reacting a 1,3-Butadiene and a Nitrile of an Acrylic Acid in the Presence of Copper or Manganese. (Synthetic.) W. D. Wolfe, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

Dominion of Canada

391,492. **Fluid Aliphatic Ketone-Diarylamine Antioxidant.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of L. Meuser, Naugatuck, and C. S. Dewey, Cheshire, co-inventors, both in Conn., U. S. A.

391,493. **Solid Aliphatic Ketone-Diarylamine Antioxidant.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. F. Tuley and R. S. Hanslick, both of Naugatuck, and C. S. Dewey, Cheshire, co-inventors, all in Conn.,

United Kingdom

523,904. **Accelerators** of Vulcanization and Their Preparation. Dunlop Rubber Co., Ltd., D. E. Twiss, and R. W. Hale.

524,279. **Preparation of Catalysts and Their Use** in the Polymerization of Hydrocarbons. (Synthetic.) A. Wasserman.

524,781. **Solvent, Oil, and Water Resistant Rubber Hydrohalide Compositions.** W. J. Tennant (Marbon Corp.).

524,849. **Manufacture of Butadiene.** (Synthetic.) Consortium Fur Electro-Chemische Industrie Ges.

524,918. **Manufacture of Butadiene.** (Synthetic.) G. W. Johnson, (I. G. Farbenindustrie A. G.).

524,973-524,975. **Co-Polymeric Products** Derived from Vinylidene Chloride. W. J. Tennant, (Dow Chemical Co.).

525,152. **Separation of Mixtures of Olefines and Paraffins.** Usines De Melle.

525,172. **Antioxidants.** Wingfoot Corp.

525,173. **Accelerators.** Wingfoot Corp.

525,198. **Preparation of Di-Olefines.** Usines De Melle.

525,250. **Composition for Obtaining Rubber-Containing Deposits** on Fibrous Substances. K. E. W. Oesterreich.

GENERAL

United States

21,594. (Reissue.) **Windshield Cleaner.** E. C. Horton, Hamburg, assignor to Trico Products Corp., Buffalo, both in N. Y.

21,595. (Reissue.) **Undergarment.** M. Imershein, assignor to Graceform-Camlin Corset Co., Inc., both of New York, N. Y.

2,213,949. **Tire Pressure Indicator** for Pneumatic Wheels. C. J. Brown, Garden City, Kans.

2,214,023. **Tire Guard.** S. Kaura, Fairmont, Nebr.

2,214,034. **Electrical Plug Connector Construction.** A. S. Knapp, Belleville, Ill., assignor, by mesne assignments, to Electrix Corp., Pawtucket, R. I.

2,214,048. **Antenna** for Motor Vehicles. G. N. Edwards, assignor to Ohio Rubber Co., both of Willoughby, O.

2,214,066. **Sanitary Device.** C. W. Peters, Caledonia, Wis.

2,214,074. **Mattress Protector** with Elastic Positioning Straps. E. C. Clarke, St. Louis Park, Minn.

2,214,087. **Apparatus for Preshrinking Textile Fabrics** Utilizing a Rubber Band. G. Schlenk, Berlin-Spandau, Germany.

2,214,090. **Pencil and Eraser.** M. E. Trollen, assignor to Brown & Bigelow, both of St. Paul, Minn.

2,214,094 and 2,214,095. **Wringer.** N. H. Watts, Glendale, Calif., assignor to Lovell Mfg. Co., Erie, Pa.

2,214,182. **Hard Rubber Laminated Product.** H. J. Schelhammer, Whitestone, assignor to American Hard Rubber Co., New York, both in N. Y.

2,214,219. **Crack Filling Tool.** P. K. Barrett, San Diego, Calif.

2,214,243. **Rubber Ring Seal** for Water Pumps. W. C. Casson, assignor to Briggs Mfg. Co., both of Detroit, Mich.

2,214,260. **Apparatus for Indirect Transfusion and Venoclysis** (Rubber Tube & Valve). E. A. Ravenscroft, Glencoe, and R. E. Jordan, Deerfield, assignors to Abbott Laboratories, North Chicago, all in Ill.

2,214,261. **Sealing Device.** A. G. Roth, Mineola, N. Y.

2,214,318. **Eyelash Curler** with Rubber Compression Strip. H. Bernstein, Brooklyn, N. Y.

2,214,514. **Automobile Bumper Construction.** M. D. Walklet, Akron, O., assignor, by mesne assignments, to American Chain & Cable Co., Inc., a corporation of New York.

2,214,549. **Elastic Top Hosiery.** H. G. Dickens, Thomasville, N. C., assignor to Scott & Williams, Inc., Laconia, N. H.

2,214,589. **Curler** with Elastic Band Hair Clamp. R. G. Leland, New York, N. Y.

2,214,597. **Self-Inflating Inner Tube** for Tires. A. C. Smith, Rosenberg, Tex.

2,214,628. **Rail Cushion.** T. B. Upchurch, Jr., Raeford, N. C.

2,214,725. **Vacuum Cleaner Attachment** with Resilient Housing. O. A. Ross, New York, N. Y.

2,214,734. **Mechanical Closure** Utilizing a Flexible Sealing Member. H. T. Kraft, assignor to General Tire & Rubber Co., both of Akron, O.

2,214,899. **Welding Method and Apparatus.** A. M. Brown, assignor, by mesne assignments, to Firestone Tire & Rubber Co., both of Akron, O.

2,214,937. **Spare Tire Mounting.** E. T. Ragsdale, Flint, Mich.

2,214,942. **Flexible Mounting** for Reciprocating Engines. A. Taub, Hendon, London, England, assignor to General Motors Corp., Detroit, Mich.

2,214,948. **Motor Vehicle Chassis** with Rubber Bushings. H. T. Youngren, Lansing, assignor to General Motors Corp., Detroit, both in Mich.

2,214,972. **Device for Cleaning Toilet Hoppers and the Like.** E. M. Ries, Camden, O.

2,215,120. **Tire Deflation Indicator.** E. J. and C. Hardy, assignors of 10% to A. L. Robinson and 50% to L. R. Smith, and P. Baldwin, all of Cordell, Okla.

2,215,135. **Burial Slipper.** C. F. Schulte, assignor to Practical Burial Slipper Co., a firm composed of C. B. and C. F. Schulte, all of Columbus, O.

2,215,152. **Threaded Socket-Type Insulator** of Rubber and Porcelain. G. E. Hosfield, Lincoln, Nebr.

2,215,153. **Tire Pressure Indicator Switch.** H. L. Hull, Anderson, Ind.

2,215,198. **Ear-Tight Bathing Cap.** C. Silbert, Chelsea, Mass.

2,215,268. **Liquid Impervious Container** with Interior Film of a Mixture of Resin and Polymerized Isobutylene. V. Himmer, Mountain Lakes, N. J.

2,215,283. **Line Supporting Clip.** P. W. Adler, West Hollywood, assignor to Adel Precision Products Corp., Burbank, both in Calif.

2,215,311. **Electric Switch.** C. A. Adams, Davenport, Iowa.

2,215,320. **Illuminating Device** for Handbags. E. W. Burns, Uhrichsville, O.

2,215,371. **Windshield Wiper Arm.** E. C. Horton, Hamburg, assignor to Trico Products Corp., Buffalo, both in N. Y.

2,215,377. **Mud Wiper for Drilling Tubing.** C. S. Penfield and U. M. Warren, both of Bakersfield, assignors to Shell Development Co., San Francisco, all in Calif.

2,215,393. **Hosiery.** J. L. Getaz, Maryville, Tenn., assignor to Scott & Williams, Inc., Laconia, N. H.

2,215,463. **Shoe Sole.** A. Di Mauro, Middletown, Conn.

2,215,515. **Weather Strip.** W. R. Matheny, assignor to N. F. Harnly, both of Chicago, Ill.

2,215,523. **Rubber-Lined Bearing.** F. L. Haushalter, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,215,655. **Vacuum Devices** Utilizing an Annular Hollow Rubber Member. N. H. Stewart, Caldwell, N. J., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

2,215,721. **Toy Pistol** with Rubber Band. F. M. Cass, Cedar Rapids, Iowa.

2,215,743. **Insulating Resilient Support.** C. Saurer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,215,760. **Floating Fishing Line** Impregnated with a Modified Vinyl Halide Polymer. (Synthetic.) R. Ledrich, Cuyahoga Falls, O.

2,215,829. **Reflector Flashlight Attachment** Utilizing a Rubber Gripping Member. O. G. Evans, Danville, Va.

2,215,840. **Tire Chain.** C. E. Smith, Fairmont, W. Va.

2,215,880. **Galosh.** U. Lasley, Chicago, Ill., assignor of one-half to Bert Halberstadt, New York, N. Y.

2,215,889. **Flush-Type Refrigerator Door** with Non-Metallic Gasket and Corner Molding Construction. E. Swedman, assignor to Seeger Refrigerator Co., both of St. Paul, Minn.

2,216,125. **Resilient Valve Stem Cap.** W. Martino, Detroit, Mich.

2,216,134. **Girdle.** H. Rabinowitz, New York, N. Y.

2,216,135. **Abrasive Grinding Wheel** with Rubber Binder. E. T. Rainier, Nutley, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,216,197 - 2,216,200. **Wringer.** W. L. Kauffman, II, assignor to Lovell Mfg. Co., both of Erie, Pa.

2,216,226. **Shoe** with a Cushion Layer of Rubber-Enmatriced Cork. E. T. Bumpous, assignor to General Shoe Corp., both of Nashville, Tenn.

2,216,280. **Acetylene Lamp Bowl** Utilizing a Band of Rubber. C. S. Packer, assignor to Justrite Mfg. Co., both of Chicago, Ill.

2,216,368. **Pneumatic Tire** with Double-Type Inner Tube. L. R. Hollingshead, New Orleans, La., assignor of 10% to G. S. Delamere, Marysville, Calif.

2,216,391. **Wringer.** W. L. Kauffman, II, Erie, Pa.

2,216,392. **Safety Means for Wringers.** W. L. Kauffman, II, Erie, Pa.

2,216,393. **Safety Mechanism** for Wringers, Etc. W. L. Kauffman, II, assignor to Lovell Mfg. Co., both of Erie, Pa.

2,216,394 - 2,216,400. **Wringer.** W. L. Kauffman, II, assignor to Lovell Mfg. Co., both of Erie, Pa.

2,216,404. **Clothes Wringer.** C. K. Skinner, Southport, Conn., assignor to General Electric Co., a corporation of New York.

2,216,429. **Cushioning Mechanism.** M. P. Blomberg, Hinsdale, Ill., assignor to National Malleable & Steel Castings Co., Cleveland, O.

2,216,473. **Combination Rubber-Coil Spring Cushioning Mechanism.** R. C. Hobson, Cleveland Heights, assignor to National Malleable & Steel Castings Co., Cleveland, both in O.

2,216,488. **Covering for Woman's Footwear.** E. W. Ellsworth, New York, N. Y.

2,216,503. **Silk-Covered Rubber Nose Pad** for Eyeglasses. E. A. Ring, Providence, R. I.

2,216,505. **Piston and Like Packing Device.** P. W. Thornhill, assignor to Automotive Products Co., Ltd., and J. H. Onions, all of London, England.

2,216,544. **Rubber-Lined Pickling Tank.** O. S. True, Scarsdale, N. Y., and E. R. Beecher, Westfield, N. J., assignors to United States Rubber Co., New York, N. Y.

2,216,580 and 2,216,581. **Shoe Stiffener** Treated with a Composition Containing a Thermoplastic Material and Rubber. R. Almy, assignor to Armstrong Cork Co., both of Lancaster, Pa.

2,216,625. **Truss Pad** with Elastic Core. W. A. Pease, Cincinnati, O., assignor to Ohio Truss Co., a corporation of Ohio.

2,216,715. **Flexible Support** for Rail Car Truck. J. Ledwinka, assignor to E. G. Budd Mfg. Co., both of Philadelphia, Pa.

2,216,744. **Wringer.** W. L. Kauffman, II, assignor of Lovell Mfg. Co., both of Erie, Pa.

2,216,745. **Safety Device** for Wringers. W. L. Kauffman, II, assignor to Lovell Mfg. Co., both of Erie, Pa.

2,216,746. **Wringer.** W. L. Kauffman, II, assignor to Lovell Mfg. Co., both of Erie, Pa.

2,216,818. **Pneumatic Seat Cushion.** H. H. Kuhlman, Mira Loma, Calif.

2,216,830. **Thermal-Insulated Container** with a Jacket Containing Small Particles of Open-Cell Rubber Surrounded by a Mass of Closed-Cell Gas-Expanded Rubber. D. Roberts, assignor to Rubatex Products, Inc., both of New York, N. Y.

2,216,852. **Dust Guard** for Trouser Legs with Rubber Band. N. A. McMeekin, Woodsville, N. H.

2,216,854. **Vehicle Suspension System** with Fluid Pressure Controlled Pneumatic Tube. R. S. Sanford, New York, N. Y., assignor to Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh, Pa.

2,216,897. **Undergarment.** H. Zoob, New York, N. Y.

2,216,999. **Lug Strap Construction.** H. M. Bacon, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,217,001. **Friction Material** with Non-Metallic Binder. C. Bockius, Stamford, Conn., and C. S. Batchelor, Hasbrouck Heights, and T. A. Cook, Paterson, assignors to Raybestos-Manhattan, Inc., Passaic, all in N. J.

2,217,032. **Shuttlecock with Elastic Wall.** A. M. Timné, Los Angeles, Calif.

2,217,080. **Tire Cord Tensile Strength Demonstrator.** H. M. Ruch, Los Angeles, Calif.

2,217,082. **Rubber Bearing Universal Joint.** C. E. Swenson, Rockford, assignor to Borg-Warner Corp., Chicago, both in Ill.

2,217,103. **Feed Hopper** for Mixing or Masticating Rubber and Like Material. R. T. Cooke, Sunningdale, assignor to Francis Shaw & Co. Ltd., Bradford, Manchester, both in England.

2,217,104. **Temporary Rubber Sealing Means** for Gas-Filled Cables. E. L. Crandall, Scotia, N. Y., assignor to General Electric Co., a corporation of New York.

2,217,122. **Antiskid Tire.** W. G. Lowry, Cincinnati, O.

2,217,138. **Electric Plug** with Resilient Body. S. T. Simpson, New York, N. Y.

2,217,139. **Tire Tool.** E. F. Smith, Edgar, Nebr.

2,217,181. **Rubber Heel** with Nail-Holding Washers. L. M. Oakley, assignor to Essex Rubber Co., both of Trenton, N. J.

2,217,231. **Rubber Impeller** for Rotary Shaft. G. G. Morse, assignor to Morse Bros. Machinery Co., both of Denver, Colo.

2,217,288. **Tire Inflator.** E. M. Morley, Delta, O., assignor, by mesne assignments, to himself and W. S. Carroll.

2,217,304. **Safety Wringer.** D. M. Berry, deceased, late of Oakland, Calif., by E. M. Berry, administratrix, Oakland, Calif.

2,217,351. **Cylinder Washer and Extractor Mechanism** with Flexible Mounting. L. E. Soderquist, assignor to National Rubber Machinery Co., both in Akron, O.

2,217,367. **Curtain Holder** with Rubber Clamp. A. C. Horsch, Mineola, N. Y.

2,217,434. **Animal Ball** with Sponge Rubber

Core. R. J. Dorn, assignor to Barr Rubber Products Co., both of Sandusky, O.

2,217,484. **Rubber Support** for Tubular Lamps. O. Kiltie, Fort Wayne, Ind., assignor to General Electric Co., a corporation of New York.

Dominion of Canada

391,173. **Ice Pack.** J. D. Bates, Springfield, Mass., U. S. A.

391,193. **Seaplane Pontoon.** A. C. McKinley, Garden City, N. Y., U. S. A.

391,223. **Pad** for Rotary Sanders. Black & Decker Mfg. Co., assignee of B. B. Ramey, both of Towson, Md., U. S. A.

391,244. **Tractor Wheel Device.** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of W. E. Hardman and R. F. Daw, co-inventors, both of Birmingham, Warwickshire, England.

391,253. **Foundation Garment.** H. W. Gossard Co., assignee of H. Wipperman, both of Chicago, Ill., U. S. A.

391,317. **Stocking Suspender.** A. S. Kinnucan, Chicago, Ill., U. S. A.

391,354. **Metal Container Sealed** and Coated on the Interior with Chlorinated Rubber. Crown Cork & Seal Co., Inc., Baltimore, Md., assignee of Crown Can Co., Philadelphia, Pa., assignee of Crown Cork and Seal Co., Inc., Baltimore, aforesaid, assignee of C. E. McManus, Spring Lake, N. J., all in the U. S. A.

391,355. **Tire Valve Stem.** Dill Mfg. Co., Cleveland, assignee of J. C. Crowley, Cleveland Heights, both in O., U. S. A.

391,364. **Tractor Rubber Track.** B. F. Goodrich Co., New York, N. Y., assignee of R. Mayne, Akron, O., both in the U. S. A.

391,427. **Inflatable Kite.** P. T. Astle, Haven, Kan., U. S. A.

391,442. **Hair Waving Apparatus.** R. M. Keele, San Francisco, Calif., U. S. A.

391,445. **Elastic Hat Fastener.** R. Lipton, New York, N. Y., U. S. A.

391,490. **Covered Elastic Yarn.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of P. A. Linke, Summit, N. J., U. S. A.

391,491. **Pneumatic Tire** with Rayon Cords. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of M. Castricum, Gross Pointe, and F. C. Kennedy, Detroit, co-inventors, both in Mich., U. S. A.

391,532. **Laminated Rubber Hydrochloride Film.** Wingfoot Corp., Wilmington, Del., assignee of R. P. Dinsmore, Akron, O., both in the U. S. A.

391,539. **Electric Switch.** Northern Electric Co., Ltd., Montreal, P. Q., assignee of Automatic Signal Corp., New York, N. Y., assignee of E. D. Stirlen and C. D. Geer, co-inventors, both of New Haven, Conn., all in the U. S. A.

391,655. **Tire Tread.** B. F. Goodrich Co., New York, N. Y., assignee of K. D. Smith, Akron, O., both in the U. S. A.

391,682. **Life Preserver** with Gas-Expanded Rubber. Rubatex Products, Inc., New York, N. Y., assignee of S. Kienitz, Shelton, Conn., both in the U. S. A.

391,684. **Vehicle Window Mounting.** Schlegel Mfg. Co., assignee of C. P. Schlegel, both of Rochester, N. Y., U. S. A.

United Kingdom

523,775. **Magnetically Loaded Cables** for Transmission of Electrical Signals. General Electric Co., Ltd., H. C. Turner, and G. R. Polgreen.

523,911 and 523,912. **Foundation Garments.** H. W. Gossard Co.

524,197. **Brassieres.** Berger Bros. Co.

524,203. **Resilient Supports.** M. F. A. Julien.

524,287. **Resilient Suspensions** for Vehicles, More Particularly Road Vehicles. Soc. Italiana Pirelli.

524,307. **Brassieres.** V. F. Kemp and Kempat, Ltd.

524,352. **Rubber Kerbs.** H. J. Haynes.

524,388. **Electric Cables.** Siemens Bros. & Co., Ltd., and H. G. Wood.

542,461. **Resilient Mounting** for the Driving Unit in Motor Vehicles. Zavody Ringhoffer-Tatra Akciova Spolecnost.

524,493. **Sand-Blasting Stencil.** N., F., and P. Van Cleef. (Trading as Van Cleef Bros.).

524,539. **Mudguards, Wings, and Like Attachments for Vehicles.** Dunlop Rubber Co., Ltd., and S. Sadler.

524,540. **Vehicle Windscreen Wipers.** J. Lucas, Ltd., A. Huyton, and R. H. Purden.

524,568. **Printing-Blocks, Molds, and Like Articles** Having an Impressed Surface. Semperit Rubber Mfg. Co., Ltd. (Semperit Oesterreichish-Amerikanische Gummiwerke A. G.).

524,610. **Submarine High-Frequency Electric Cables.** Telegraph Construction & Maintenance Co., Ltd., and E. W. Smith.

524,674. **Electric Communication Cables.** Standard Telephones & Cables, Ltd., E. Baguley, and A. L. Long.

524,707. **Vehicle Tire.** A. Berchtold.

524,770. **Elastic Tensioning Device** to Hold Trousers in Position. C. Barosi.

524,780. **Gaskets.** W. J. Tennant, (Marbon Corp.).

524,796. **Electric Cables.** Commercial Secretaries, Ltd., B. Welbourn, and W. P. and J. R. S. Orchard.

524,839. **Inflatable Spherical Balls.** Hungarian Rubber Goods Factory, Ltd.

524,894. **Resilient Joint or Mounting.** H. C. Lord.

524,929. **Aircraft Undercarriages** with Resiliently Mounted Landing Elements. G. H. Dowty.

524,954. **Resilient Transmission Joints.** M. F. A. Julien.

524,989. **Electric Cables.** Pirelli-General Cable Works, Ltd., and R. E. Horley.

524,990. **Inner Tube Constructions** for Tires. Firestone Tire & Rubber Co., Ltd.

525,017. **Protection Fenders or the Like.** O. F. Swanborough, F. H. Harding, W. Thomson-Taylor, Avon India Rubber Co., Ltd., and Imperial Airways, Ltd.

525,074. **Windscreen Wipers.** Wingard (M.A.), Ltd., and C. B. Vincent.

525,086. **Flexible Couplings** for Tubes. A. L. Parker.

525,210. **Metal Containers.** Firestone Tire & Rubber Co.

525,240. **Wallpaper and Similar Sheet Materials and Methods of Attachment Thereof to a Surface.** T. A. Clayton, (United States Rubber Co.).

525,266. **Fluid-Pressure Apparatus** to Control the Operation of Brakes for Aircraft. Dunlop Rubber Co., Ltd., G. E. Beharrell, J. Wright, and H. Trevaskis.

525,306. **Gland Packings** Particularly for Valves or Cocks. Dunlop Rubber Co., Ltd., A. O. Walsh, and S. A. Brazier.

TRADE MARKS

United States

380,710. **Traveler.** Tires. National Tire Stores, Inc., Denver, Colo.

380,724. Representation of the word: **"Minuet"** superimposed on a musical note, above the words: **"The style note for juniors."** Footwear. J. C. Penney Co., Wilmington, Del.

380,740. Representation of a label containing four shaded areas, the top area containing the word: **"Zenith."** Tires and tubes. Marshall-Wells Co., doing business as Zenith Rubber Co., Duluth, Minn.

380,848. **Jeepers.** Clothing. Sears, Roebuck & Co., Chicago, Ill.

380,861. **Flexon.** Synthetic rubber. Standard Oil Development Co., Linden, N. J.

380,923. **Victoprene.** Fluid seals, partly of synthetic rubber, plastic polymers, and metal. Victor Mfg. & Gasket Co., Chicago, Ill.

380,952. Representation of two Grecian pillars and between them the words: **"Thom McAn Tailored Classics."** Footwear. Melville Shoe Corp., New York, N. Y.

380,976. A color mark shown on the edge of the goods in contrasting colors, black, red, and black, produced arbitrarily in the manufacture of the goods by permanently uniting three laminated layers of color in the order named, with the red lamination in the center. Tire tube patches. H. B. Egan Mfg. Co., Muskogee, Okla.

380,977. A color mark shown on the edge of the goods in contrasting colors, gray, red, and gray, produced arbitrarily, in the manufacture of the goods by permanently uniting three laminated layers of color in the order named, with the red lamination in the center. Tire tube patches. H. B. Egan Mfg. Co., Muskogee, Okla.

380,978. A color mark shown on the edge of the goods in contrasting colors, red, black, and red, produced arbitrarily in the manufacture of the goods by permanently uniting three laminated layers of color in the order named, with the black lamination in the center. Tire tube patches. H. B. Egan, Mfg. Co., Muskogee, Okla.

380,997. **Rover.** Footwear. Wm. Hahn & Co., Washington, D. C.

381,015. **Narragansett.** Clothing. Jacob Finkelstein & Sons, Woonsocket, R. I.

381,016. Representation of white question marks superimposed on solid black "Q" and "O" in the word: **"Quiz-A-Coat."** Clothing. Jacob Finkelstein & Sons, Woonsocket, R. I.

381,192. **Royalflex.** Rubber and fabric upholstery material. United States Rubber Co., New York, N. Y.

381,203. **"Tuf-tex,"** with the letters "uf-tex" underscored. Belting and hose. J. A. Tumbler, doing business as Rubber Products Co., Baltimore, Md.

381,219. **K-Treated.** Fabric coated or impregnated with synthetic rubber. B. F. Goodrich Co., New York, N. Y.

381,270. **"Firestone Champion All Tread."** Tire repair material. Firestone Tire & Rubber Co., Akron, O.

381,291. **Codel.** Felts and fabrics coated with rubber. Cotan Corp., Newark, N. J.

381,292. **Codur.** Felts and fabrics coated with rubber. Cotan Corp., Newark, N. J.

381,437. Representation of a diamond containing segmented shaded areas and the words: **"Parablox"** and **"Parablox"** bisecting each other at right angles. Cutting blocks of rubber for use in cutting leather, cloth, paper, etc. Endicott Johnson Corp., Endicott, N. Y.

381,467. **Stenor.** Non-vulcanized rubber and canvas patching material. Stenor Inc., Stamford, Conn.

381,506. **Vaporex.** Unvulcanized rubber for tire retreading and recapping. Mohawk Rubber Co., Akron, O.

381,558. **Micaphane.** Rain capes and baby pants. United States Rubber Co., New York, N. Y.

381,603. **Silverleaf.** Rubber gloves. Armstrong Cork Co., Lancaster, Pa.

381,630. **LiveGlas.** Belts, suspenders, and garters. Hickok Mfg. Co., Inc., Rochester, N. Y.

381,644. Representation of a man's head in silhouette below the word: **"Johnsonian."** Footwear. Endicott Johnson Corp., Endicott, N. Y.

381,652. **Treasurette.** Clothing. I. Lawrence Lesavoy, Allentown, Pa.

381,654. **Treasurepak.** Clothing, Rayon Corp. of America, Allentown, Pa.

381,657. **The Younger Set.** Clothing. Saks & Co., New York, N. Y.

381,658. **Scho-pedic.** Footwear. Dr. Scholl's Foot Comfort Shops, Inc., Chicago, Ill.

381,668. Representation of a fanciful design containing the letters: **"T"** and **"S"** surrounded by parallel lines. Rubber toplifts. A. E. Siegmann, doing business as T. S. Toplifting Co., Cincinnati, O.

381,674. **Villagers.** Footwear. Chas. A. Stevens & Co., Chicago, Ill.

381,682. **Playtex.** Girdles. International Latex Corp., Dover, Del.

381,695. **Curlatex.** Latex tampico pad for mattress insulation. Berry Bedding Corp., Long Island City, N. Y.

381,698. Fanciful representation of a shining sun containing two palm trees and the words: **"California Roust-abouts."** Footwear. B. Warshauer, Stockton, Calif.

381,780. **Rub-bub.** Rubber flooring adhesive. S. D. Moore, doing business as Sam Moore & Co., Cleveland, O.

381,805. **Hi-Jac.** Abdominal supporters. Blair Corset Co., Chicago, Ill.

381,818. **East Coast.** Clothing. East Coast Merchandise Co., Inc., New York, N. Y.

381,820. **Timesaver.** Tire grooving tools. Timesaver Products Co., Seattle, Wash.

381,844. **Herniatician.** Anatomical supports and appliances. Chesterman-Leeland Co., Philadelphia, Pa.

Tire Production Statistics

Pneumatic Casings

	Inventory	Production	Shipments
1938	8,451,390	40,906,735	43,132,302
1939	8,664,505	57,612,731	57,508,775
1940			
Jan.	9,347,953	4,953,585	4,270,137
Feb.	10,123,824	4,888,250	4,112,379
Mar.	10,747,370	5,007,042	4,345,674
Apr.	10,881,029	5,105,953	5,009,762
May	10,576,217	5,415,314	5,720,249
June	8,881,101	5,147,871	6,926,553
July	9,299,014	4,706,525	4,314,799
Aug.	9,732,108	4,621,223	4,173,508

Pneumatic Casings

	Original Equipment	Replacement Sales	Export Sales
1938	10,716,130	30,565,008	1,048,934
1939	18,207,556	38,022,034	1,279,185
1940			
Jan.	1,804,826	2,376,455	88,856
Feb.	1,974,466	2,051,487	86,426
Mar.	2,050,250	2,217,627	77,797
Apr.	2,095,220	2,823,293	91,249
May	1,998,735	3,635,652	85,862
June	1,925,420	4,918,341	82,792
July	857,684	3,377,166	79,949
Aug.	704,565	3,386,629	82,314

Inner Tubes

	Inventory	Production	Shipments
1938	8,165,696	37,847,656	40,292,614
1939	7,035,671	50,648,556	51,190,314
1940			
Jan.	7,633,798	4,286,924	3,826,667
Feb.	7,896,960	4,210,904	3,809,733
Mar.	8,182,655	4,399,550	4,113,735
Apr.	8,258,331	4,618,361	4,542,735
May	8,243,050	4,739,072	4,738,668
June	6,841,281	4,359,486	5,721,096
July	7,093,996	4,027,495	3,792,962
Aug.	7,802,303	4,313,813	3,599,626

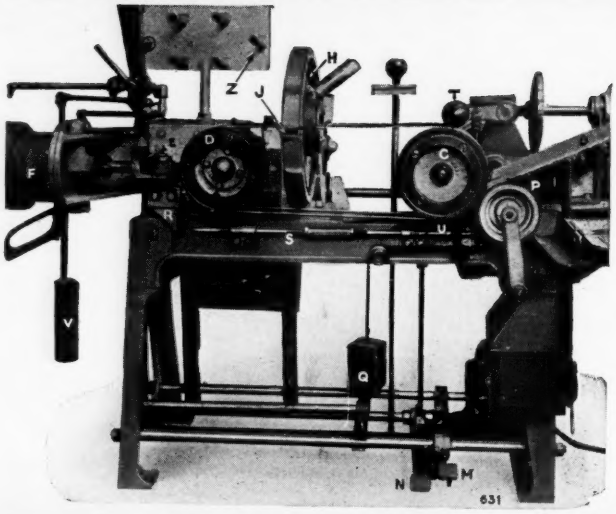
Source: The Rubber Manufacturers Association, Inc. Figures adjusted to represent 100% of the industry.

MONOBAND SYSTEM

CYCLE TYRE PLANT

The "Monoband" System embodies the latest developments for making wired-on cycle tyres. This process reduces labour costs to a minimum.

The "Monoband" machine with Tread Feed builds the foundation of the tyre and applies the rubber covering, completing the whole tyre at one operation with a production of from 60-90 complete covers per hour.



SHAW

FRANCIS SHAW & CO. LTD., MANCHESTER, 11, ENGLAND

LIQUID LATEX

NORMAL and CONCENTRATED

Agents in U. S. A. for Dunlop Concentrated 60% Latex, Product of Dunlop Malayan Estates, Ltd.

CHARLES T. WILSON CO., INC.

99 WALL STREET **NEW YORK, N. Y.**

SALES REPRESENTATIVES

BOSTON, Ernest Jacoby & Co., 79 Milk St. AKRON, Charles T. Wilson Co., Inc., 803 United Bldg.
PACIFIC COAST, J. B. Ruth & Co., 124 South Central Avenue, Los Angeles, Calif.

Stamford Neophax Vulcanized Oil

(Reg. U. S. Pat. Off.)

Factice THE STAMFORD RUBBER SUPPLY CO Vulcanized Oil

For Use with Neoprene

THE STAMFORD RUBBER SUPPLY CO. STAMFORD CONN.

Makers of Stamford Factice Vulcanized Oil
SINCE 1900

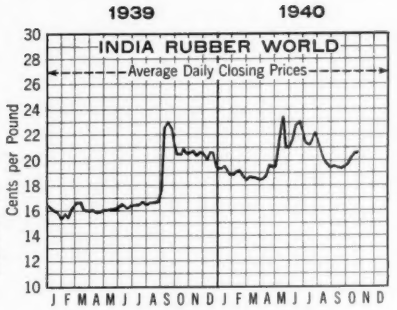
Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES ON THE NEW YORK MARKET

Futures	Aug. 31	Sept. 28	Oct. 5	Oct. 12	Oct. 19	Oct. 26
"New" Standard						
Oct.	19.10	19.55	19.73	20.40	20.38	20.35
Nov.	.....	19.52	19.68	20.36	20.33	20.32
Dec.	19.10	19.49	19.66	20.32	20.28	20.30
Mar.	18.95	19.32	19.50	19.85	19.90	19.94
July	18.85	19.10	19.23	19.55	19.55	19.60
Sept.	.....	.....	.....	19.18	19.50	19.50	19.55
No. 1 Standard						
Oct.	19.13	19.55	19.70	20.37	20.38	20.35
Nov.	.....	19.52	19.67	20.34	20.33	20.32
Dec.	19.15	19.49	19.65	20.32	20.28	20.30
Mar.	19.05	19.32	19.50	19.85	19.90	19.94
May	18.92	19.20	19.38	19.67	19.70	19.75
Volume (tons) per week						
"New" Standard	800	430	290	720	260	30
No. 1 Standard	8,070	4,200	2,220	4,060	2,540	1,940



New York Outside Market—Spot Ribbed Smoked Sheets

INCREASED tension over controversial issues in the Far East sent rubber futures prices, particularly those of nearby months, to higher levels during October. After closing at 19.52¢ per pound on September 30, November futures (old contract) advanced sharply to reach 20.53¢ per pound on October 14. With the tension somewhat relaxed, the price ruled slightly easier and closed at 20.43¢ per pound on October 23. Thereafter the market was easy, and the closing price on October 29 was 20.32¢. Domestic crude rubber consumption during October was well maintained, and it is believed that the total for the month will be at least as high as the September figure of 50,206 long tons. Current indications also point toward a consumption above 50,000 tons monthly for November and December. At the end of September supplies of crude rubber here showed an increase of 13.3% over those of the preceding month. Based on current consumption of about 50,000 tons monthly, stocks on hand together with rubber afloat to this country amount to 7½ months' supply as of September 30. September imports of crude rubber into the United States exceeded all previous records, rising to a high of 78,973 tons. The record high imports are expected to continue through the balance of this year and during the first quarter of next year.

It will be recalled that purchases of rubber by the Rubber Reserve Co. are to be made within a price range of 18 to 20¢ per pound. With spot prices of rubber above this level, it would appear that Government purchases will have to be restricted temporarily to distant deliveries.

A meeting of the International Rubber Regulation Committee is scheduled for November. No definite date has been set, but it is expected that the meeting will be held on either November 12 or 19.

New York Outside Market Rubber Quotations

Latex	Oct. 27, 1939	Sept. 25, 1940	Oct. 28, 1940
Normal, 38-40%, *gal.*	$0.78/0.79	$0.74/0.75	$0.78/0.79
Centrifuged, 60-63% ....*gal.*	.. ..	1.28/1.30	1.35/1.36
Paras			
Upriver fine....*lb.*	.16¾	.15¾	.16¾
Upriver fine....*lb.*	*.21½	*.18	*.19¾
Upriver coarse.*lb.*	.11½	.11	.11½
Upriver coarse.*lb.*	*.19	*.15¼	*.17
Islands fine....*lb.*	.17	.15	.16
Islands fine....*lb.*	*.21	*.17½	*.19
Acre, Bolivian fine .....*lb.*	.17	.15¾	.17
Acre, Bolivian fine .....*lb.*	*.22	*.18¼	*.20
Beni, Bolivian fine .....*lb.*	.18	.17½	.18
Madeira fine...*lb.*	.16¾	.15½	.16¾
Caucho			
Upper ball.....*lb.*	.11½	.11	.11½
Upper ball.....*lb.*	*.19	*.15¼	*.17
Lower ball.....*lb.*	.11	.10	.10½
Pontianak			
Pressed block..*lb.*	.13/.18	.19/.22	.15/.20
Guayule			
Ampar .....*lb.*	.15	.15½	.15½
Africans			
Rio Nuñez ..*lb.*	.17½	.18½	.18½
Black Kassai...*lb.*	.17½	.18½	.18½
Prime Niger flake .....lb.	.25	.22½	.22½
Gutta Percha			
Gutta Siak ....*lb.*	.15	.19½	.16
Gutta Soh .....*lb.*	.17	.28	.24
Red Macassar..*lb.*	1.20	1.20	1.20
Balata			
Block Ciudad Bolivar .....*lb.*	.32	.45	.45
Manaos block..*lb.*	.32	.52	.50
Surinam sheets.*lb.*	.43	.48	.47
Amber .....*lb.*	.45	.50	.49

* Washed and dried crepe. Shipments from Brazil.

New York Outside Market

With the advance in crude rubber prices the outside market became active,

New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	September, 1940							October, 1940															
	23	24	25	26	27	28	30	1	2	3	4	5	7	8	9	10	11	12†	14	15	16	17	18	19
No. 1-X R.S.S. in cases*..	19⅜	19⅜	19½	19½	19⅝	19¾	19¾	19¾	19¾	19¾	19⅞	19⅞	19⅞	20	20¼	20¼	20½	..	20¾	20⅝	20⅜	20⅝	20½	20½
No. 1 Thin Latex Crepe.....	19¼	19¼	19⅜	19⅜	19½	19⅝	19⅝	19⅝	19⅝	19⅝	19¾	19⅞	19⅞	20	20¼	20¼	20½	..	20¾	20⅝	20⅜	20⅝	20½	20½
No. 2 Thick Latex Crepe....	19¼	19¼	19⅜	19⅜	19½	19⅝	19⅝	19⅝	19⅝	19⅝	19¾	19⅞	19⅞	20	20¼	20¼	20½	..	20¾	20¾	20½	20¾	20⅝	20⅝
No. 1 Brown Crepe.....	18	18	18⅛	18⅛	18¼	18⅜	18⅜	18⅜	18⅜	18⅜	18½	18½	18½	18⅝	18⅞	18⅞	19⅛	..	19⅜	19⅛	18⅞	19⅛	19	19
No. 2 Brown Crepe.....	17⅝	17⅝	17¾	17¾	17⅞	18	18	18	18	18	18¼	18¼	18¼	18⅜	18⅝	18⅝	18⅞	..	19⅛	18⅞	18⅝	18⅞	18¾	18¾
No. 2 Amber.....	18	18	18⅛	18⅛	18¼	18⅜	18⅜	18⅜	18⅜	18⅜	18½	18½	18½	18⅝	18⅞	18⅞	19⅛	..	19⅜	19¼	18⅞	19⅛	19	19
No. 3 Amber.....	17⅝	17⅝	17¾	17¾	17⅞	18	18	18	18	18	18¼	18¼	18¼	18⅜	18⅝	18⅝	18⅞	..	19⅛	18⅞	18⅝	18⅞	18¾	18¾
Rolled Brown.....	14⅜	14⅜	14½	14½	14⅝	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14⅞	15⅛	15⅛	15⅜	..	15⅝	15½	15¼	15½	15⅜	15⅜

New York Outside Market (Continued)

	October, 1940					
	21	22	23	24	25	26
No. 1-X R.S.S. in cases*.....	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
No. 1 Thin Latex Crepe.....	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
No. 2 Thick Latex Crepe.....	20¾	20¾	20¾	20¾	20¾	20¾
No. 1 Brown Crepe	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛
No. 2 Brown Crepe	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞
No. 2 Amber.....	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛
No. 3 Amber.....	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞
Rolled Brown	15½	15½	15½	15½	15½	15½

*No. 1 Ribbed Smoked Sheets are ⅛¢ lower than No. 1-X R.S.S. in cases quoted here. †Holiday.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
†278	Rubber pedals	Medan, Sumatra
†280	Garters and raincoats	Medan, Sumatra
†329	Nursing bottles with nipples.....	Cairo, Egypt
†336	Rubber erasers	Baghdad, Iraq
†356	Nipples for feeding bottles, and rubber toys	Medan, Sumatra
†369	Wire and vibrators	Medan, Sumatra

† Purchase.

and a large amount of factory and shipment business was transacted, particularly at the middle of the month when tension over the Far Eastern situation was at its height. The outside market was strong, in company with the futures market, and the price of No. 1-X ribbed smoked sheets, packed in cases, after closing at 19¾¢ per pound on September 30, advanced sharply to reach 20¾¢ on October 14 and then became somewhat easier, closing at 20⅝¢ per pound on October 23. The closing price on October 29 was 20⅝¢ per pound, with the market steady.

RUBBER SCRAP

THE demand for scrap rubber during October was reported at a high level, with increased reclaim activity. A continuance of good conditions is expected during the balance of the year. The market, reflecting demand, is strong, and several grades of scrap rubber (inner tubes, black boots and shoes, mixed solid tires, white mechanicals, and hose) advanced in price. Other grades continue unchanged.

Consumers' Buying Prices

(Carlot Lots for September 23, 1940)

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01³/₁₀/$0.01⅜
Colored	lb.	.00¾/ .01
Untrimmed arctics	lb.	.00¾/ .01
Inner Tubes		
No. 1, floating	lb.	.11 / .12
No. 2, compound	lb.	.04¾/ .04⅞
Red	lb.	.04½/ .04¾
Mixed tubes	lb.	.04 / .04⅛
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	15.00 /15.50
Beadless	ton	18.50 /19.00
Auto tire carcass	ton	38.00 /44.00
Black auto peelings	ton	42.00 /44.00
Solid		
Clean mixed truck	ton	32.00 /34.00
Light gravity	ton	42.00 /44.00
Mechanicals		
Mixed black scrap	ton	20.00 /22.00
Hose, air brake	ton	18.00 /20.00
Garden, rubber covered	ton	12.00 /14.00
Steam and water, soft	ton	12.00 /14.00
No. 1 red	lb.	.02¾/ .03
No. 2 red	lb.	.02¼/ .02½
White druggists' sundries	lb.	.03¾/ .04
Mixed mechanicals	lb.	.02½/ .02⅝
White mechanicals	lb.	.03¾/ .04
Hard Rubber		
No. 1 hard rubber	lb.	.11½/ .13

IMPORTS, CONSUMPTION, AND STOCKS

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks—Long Tons

Twelve Months	U.S. Imports*	U.S. Consumption¶	U.S. Stocks Mfrs., Dealers, Importers, Etc.†¶	U.S. Stocks Afloat	U.K.—Public Warehouses, London, Liverpool†‡	Singapore and Penang Dealers and Port Stocks†‡	World Production (Net Exports)‡	World Consumption Estimated‡	World Stocks†‡§
1937	584,851	543,600	262,204	63,099	57,785	44,792	1,139,800	1,105,002	646,252
1938	400,178	437,031	231,500	45,105	86,853	27,084	894,900	942,252	596,498
1939	499,616	592,000	125,800	91,095	44,917*a*	15,299	1,004,429	1,110,358	447,666*a*
1940									
Jan	72,520	54,978	142,368*b*	90,285 *b*	.....	35,928	108,883	105,998	.....
Feb.	43,088	49,832	134,328*b*	112,257 *b*	.....	33,563	113,863	96,537	.....
Mar.	59,277	50,192	142,414*b*	113,619 *b*	.....	23,830	112,240	102,457	.....
Apr.	70,699	50,103	162,459*b*	102,557 *b*	.....	42,239	88,330	100,504	.....
May	51,431	51,619	161,446*b*	109,364 *b*	.....	32,731	123,008	95,100	.....
June	53,889	46,506	168,235*b*	119,138 *b*	.....	32,375	111,006	78,535	.....
July	69,596	47,011	190,222*b*	139,629 *b*	.....	36,750	127,575	76,070	.....
Aug.	73,028	50,234	213,002*b*	141,286*b*	.....	40,425	119,697	80,022	.....
Sept.	78,973	50,206	241,358*b*	137,033*b*	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡*Statistical Bulletin of the International Rubber Regulation Committee.* §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, regulated areas, and afloat. ¶Corrected to 100% from estimate of reported coverage. *a.* Stocks as of Aug. 31, 1939. *b.* Includes government barter rubber.

RECLAIMED RUBBER

ACCORDING to R. M. A. figures, September reclaimed rubber consumption is estimated at 14,589 long tons, 2.6% above that of August; production, 16,428 long tons; and stocks on hand September 30, 30,287 long tons. Consumption during October was running up to or somewhat better than during the preceding month, with continued activity anticipated during November and December.

The market is steady, and all grades of reclaim continue at last month's quotations.

New York Quotations

October 23, 1940

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	6 / 6¼
Acid	1.18-1.22	7 / 7¼
Shoe		
Standard	1.56-1.60	6½/ 6¾
Tubes		
Red Tube	1.15-1.30	9 / 9¼
Compound	1.10-1.20	9 /10
Miscellaneous		
Mechanical Blends	1.25-1.50	4½/ 5
White	1.35-1.50	12½/14

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

United States Reclaimed Rubber Statistics—Long Tons

Year	Production†	Consumption†	Consumption % of Crude	U.S. Stocks*†	Exports
1938	122,403	120,800	27.6	23,000	7,403
1939	186,000	170,000	28.7	25,250	12,611
1940					
Jan.	19,297	16,070	29.2	27,418	1,059
Feb.	17,992	15,370	30.8	28,602	1,436
Mar.	17,234	15,931	31.7	28,488	1,420
Apr.	16,568	16,298	32.5	27,558	977
May	17,552	15,719	30.5	28,397	866
June	16,631	14,912	32.1	29,260	1,207
July	14,342	14,298	30.4	28,058	1,244
Aug.	17,213	14,224	28.3	29,786	1,300
Sept.	16,428	14,589	29.1	30,287	....

*Stocks on hand the last of the month or year. †Corrected to 100% from estimate of reported coverage. *Compiled by The Rubber Manufacturers Association, Inc.*

THE R. M. A. estimates that United States rubber manufacturers in September consumed 50,206 long tons of crude rubber, less than 1% under the August consumption of 50,234 (revised) long tons, and 2.3% below September, 1939, when 51,402 (revised) long tons were consumed.

Gross imports for September, as reported by the Department of Commerce, were 78,973 long tons, the highest on record and 8.1% over the August figure of 73,028 long tons and 109.5% over the 37,689 long tons imported in September, 1939.

Total domestic stocks on September 30 are estimated by the Association to be 241,358 long tons, including 50,425 long tons of government emergency rubber, 13.3% over the 213,002 (revised) long tons on hand August 31, and 76.4% over the 136,824 (revised) long tons that were on hand September 30, 1939.

Crude rubber afloat to U. S. ports on September 30 is estimated at 137,033 long tons, against 141,286 long tons reported afloat on August 31, and 68,310 long tons afloat September 30, 1939.

Hydrated Aluminas—Fillers for Rubber

THREE grades of hydrated aluminas, C-730, C-740, and C-741, are said to impart to rubber: high modulus combined with high elasticity; high resilience at high loadings; improved aging characteristics; resistance to abrasion; and good dielectric properties. Further, they are claimed to impart no odor to the rubber and to provide the uncured compound with a high modulus and good tackiness.

All three grades have spherical particles, with an average size of 0.4-micron and a maximum size of 0.8-micron. These aluminas are white in color and have a specific gravity of 2.35. To aid dispersion in rubber, the particles of C-740 have a surface coating of coconut oil; while a coating of stearic acid is used in the case of C-741. The particles of C-730 receive no special treatment.

COMPOUNDING INGREDIENTS

THE demand for compounding ingredients during October held generally to the high level of the preceding month, and in some cases a somewhat increased activity was reported. With increased output of rubber goods anticipated on the basis of national defense requirements and better domestic needs, the outlook for November and December is favorable.

CARBON BLACK. The demand from the rubber industry was heavy and at about the same level as September. Producers' inventories were reported to be 158,000,000 pounds on October 1, a gain of 8,500,000 pounds during September. It is believed that a further gain will be shown for October. Prices are firm and unchanged.

FACTICE OR RUBBER SUBSTITUTE. Good demand was reported, with a continuance of activity expected for the balance of the year. Prices are steady.

LITHARGE. Successive price increases last month advanced the car lot price from 6¾¢ to 7¼¢ per pound; five tons or more, from 7¼¢ to 8¼¢; and smaller lots, from 7¾¢ to 8¾¢. The demand was active.

LITHOPONE. Contract deliveries were at a good level, and new business was satisfactory. The price continues firm and unchanged.

RUBBER CHEMICALS. The demand for accelerators and antioxidants was reported active and up to the high September level. Spotty conditions were said to prevail in certain quarters, but these did not affect the total demand. Prices are generally steady.

RUBBER SOLVENTS. The demand from the tire industry continued heavy. Prices remain unchanged.

TITANIUM PIGMENTS. The demand continued at a high level. Prices are firm.

ZINC OXIDE. Shipments to both the paint and rubber industry continued heavy. Prices are steady.

Current Quotations*

Abrasives

Pumicestone, powdered	lb.	$0.03 / $.035
Rottenstone, domestic	lb.	.03 / .035
Silica, 15	ton	

Accelerators, Inorganic

Lime, hydrated, *l.c.l.*, New York	ton	20.00
Litharge (commercial)	lb.	.075

Accelerators, Organic

A-1	lb.	.24 / .30
A-10	lb.	.31 / .35
A-11	lb.	.52 / .65
A-19	lb.	.52 / .65
A-32	lb.	.70 / .80
A-77	lb.	.42 / .55
A-100	lb.	.42 / .55
Accelerator 49	lb.	.40 / .42
737	lb.	.42 / .43
737-50	lb.	.25 / .26
808	lb.	.70 / .72
833	lb.	1.15
Acrin	lb.	.60
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	.55 / .60
B-J-F	lb.	.50 / .55
Beutene	lb.	$0.70 /$0.75
Butyl Eight	lb.	.98 / 1.00
Zimate	lb.	2.50
C-P-B	lb.	2.00
Captax	lb.	.50 / .55
Crylene	lb.	.40 / .47
Paste	lb.	.30 / .36
D-B-A	lb.	2.00
Delac A	lb.	.40 / .50
O	lb.	.40 / .50
P	lb.	.40 / .50
Di-Esterex-N	lb.	.60 / .70
DOTG (Di-ortho-tolyguanidine)	lb.	.44 / .46
DPG (Diphenylguanidine)	lb.	.35 / .45
El-Sixty	lb.	.50 / .65
Ethylideneaniline	lb.	.42 / .43
Ethyl Zimate	lb.	2.50
Formaldehyde P.A.C.	lb.	.06
Formaldehydeaniline	lb.	.31
Formaldehyde-para-toluidine	lb.	.52 / .54
Guantal	lb.	.40 / .50
Hepteen	lb.	.35 / .40
Base	lb.	1.35 / 1.50
Hexamethylenetetramine U.S.P.	lb.	.39
Technical	lb.	.33
Lead oleate, No. 999	lb.	.13
Witco	lb.	.15
Ledate	lb.	2.35
Monex	lb.	2.35
Novex	lb.	
O-N-V	lb.	1.00 / 1.10
O-X-A-F	lb.	.50 / .55
Ovac	lb.	.50 / .55
Oxynone	lb.	.64 / .80
Para-nitroso-dimethylaniline	lb.	.85
Pentex	lb.	1.00 / 1.10
Flour	lb.	.15 / .16
Phenex	lb.	.50 / .55
Pip-Pip	lb.	2.50
Pipsolene	lb.	1.55 / 1.85
R-2	lb.	1.40 / 1.80
R-23	lb.	.40
R & H 50-D	lb.	.42 / .43
Rotax	lb.	.60 / .65
Safex	lb.	1.20 / 1.30
Santocure	lb.	.80 / 1.00
Selenac	lb.	2.75
SPDX	lb.	.70 / .75
A	lb.	.70 / .75
Super-sulphur No. 1	lb.	.50
2	lb.	.18 / .20
Tetrone A	lb.	2.70
Thiocarbanilide	lb.	.24 / .30
Thionex	lb.	2.35
Thiurad	lb.	2.35
Trimene	lb.	.55 / .65
Base	lb.	1.05 / 1.20
Triphenylguanidine (TPG)	lb.	.45
Tuads	lb.	2.35
Ulto	lb.	1.25 / 1.75
Ureka	lb.	.60 / .75
Blend B	lb.	.60 / .75
C	lb.	.56 / .65
Vulcanex	lb.	.42 / .43
Vulcanol	lb.	.85
Z-B-X	lb.	2.50
Zenite	lb.	.46 / .48
A	lb.	.53 / .55
B	lb.	.46 / .48
Zimate	lb.	2.35

Activators

Aero Ac 50	lb.	.46 / .56
Barak	lb.	.50
MODX	lb.	.30 / .35
SL No. 10	lb.	.12

Age Resisters

AgeRite Alba	lb.	1.50 / 1.65
Exel	lb.	1.00 / 1.02
Gel	lb.	.57 / .59
Hipar	lb.	.65 / .67
Powder	lb.	.52 / .54
AgeRite Resin	lb.	.52 / .54
D	lb.	.52 / .54
White	lb.	1.25 / 1.40
Akroflex C	lb.	.56 / .58
Albasan	lb.	.70 / .75
Aminox	lb.	.52 / .61
Antox	lb.	.56
B-L-E	lb.	.52 / .61
Powder	lb.	.65 / .74
B-X-A	lb.	.52 / .61
Copper Inhibitor X-872-A	lb.	1.15
Flectol B	lb.	.52 / .65
H	lb.	.52 / .65
White	lb.	.90 / 1.15
M-U-F	lb.	1.50
Neozone (standard)	lb.	.63
A	lb.	.52 / .54
B	lb.	.63
C	lb.	.52 / .54
D	lb.	.52 / .54
E	lb.	.63
Oxynone	lb.	.64 / .80
Parazone	lb.	.68
Permalux	lb.	1.20
Santoflex B	lb.	.52 / .65
BX	lb.	.58 / .71
Santovar A	lb.	1.15 / 1.40
Solux	lb.	$1.30
Stabilite	lb.	.52 /$0.54
Alba	lb.	.70 / .75
Thermoflex A	lb.	.65 / .67
Tysonite	lb.	.16
V-G-B	lb.	.52 / .61

Alkalies

Caustic soda, flake, Columbia (400-*lb. drums*)	100 lbs.	2.70 / 3.55
liquid, 50%	100 lbs.	1.95
solid (700-*lb. drums*)	100 lbs.	2.30 / 3.15

Antiscorch Materials

A-F-B	lb.	.35 / .40
Antiscorch T	lb.	.90
Cumar RH	lb.	.10
E-S-E-N	lb.	.35 / .40
R-17 Resin (*drums*)	lb.	.10
RM	lb.	1.25
Retarder W	lb.	.36
Retardex	lb.	.45 / .48
U-T-B	lb.	.35 / .40

Antisun Materials

Heliozone	lb.	.22 / .23
S.C.R.	lb.	.33 / .35
Sunproof	lb.	.22 / .27

Brake Lining Saturant

B.R.T. No. 3	lb.	.0165/ .0175

Colors

Black

Du Pont powder	lb.	.42 / .44
Lampblack (commercial), *l.c.l.*	lb.	.15

Blue

Brilliant	lb.	
Du Pont dispersed	lb.	.83 / 3.95
Powders	lb.	2.25 / 3.75
Toners	lb.	.08 / 3.85

Brown

Mapico	lb.	.11

Green

Brilliant	lb.	
Chrome, light	lb.	
medium	lb.	.22
oxide (*freight allowed*)	lb.	
Dark	lb.	
Du Pont dispersed	lb.	.98 / 1.75
Powders	lb.	1.00 / 3.50
Guignet's (*bbls.*)	lb.	.70
Light	lb.	
Toners	lb.	.85 / 3.75

Orange

Du Pont dispersed	lb.	.88 / .98
Powders	lb.	.88 / 3.75
Lake	lb.	
Toners	lb.	.40 / 1.60

Orchid

Toners	lb.	1.50 / 2.00

Pink

Toners	lb.	1.50 / 2.00

Purple

Permanent	lb.	
Toners	lb.	.60 / 2.10

Red

Antimony Crimson, 15/17%	lb.	
R. M. P. No. 3	lb.	.48
Sulphur free R.M.P.	lb.	.52
Golden 15/17%	lb.	
7-A	lb.	.37
Z-2	lb.	.23
Cadmium, light (400-*lb. bbls.*)	lb.	.75 / .80
Chinese	lb.	
Crimson	lb.	
Du Pont dispersed	lb.	.93 / 2.05
Powders	lb.	.285 / .90
Mapico	lb.	.0925
Medium	lb.	
Rub-Er-Red (*bbls.*)	lb.	.0925
Scarlet	lb.	.08 / 2.00
Toners	lb.	.08 / 2.00

White

Lithopone (*bags*)	lb.	.0360/ .0385
Albalith	lb.	.0360/ .0385
Astrolith (50-*lb. bags*)	lb.	.0360/ .0385
Azolith	lb.	.0360/ .0385
Titanium Pigments		
Ray-Bar	lb.	.0525/ .0575
Ray-Cal	lb.	.05 / .0525
Rayox	lb.	.13
Titanolith (50-*lb. bags*)	lb.	.05 / .0525
Titanox-A (50-*lb. bags*)	lb.	.13 / 1375
B (50-*lb. bags*)	lb.	.0525/ .0550
30 (50-*lb. bags*)	lb.	.0525/ .0550
C (50-*lb. bags*)	lb.	.05 / .0525
M (50-*lb. bags*)	lb.	.0525/ .0550
Ti-Tone	lb.	
Zopaque (50-*lb. bags*)	lb.	.13 / .137

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing all known ingredients. Requests for information not recorded will receive prompt attention.

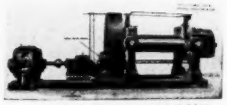
Zinc Oxide			
Azo ZZZ-11	lb.	$0.065	/$0.0675
44	lb.	.065	/ .0675
55	lb.	.065	/ .0675
66	lb.	.065	/ .0675
French Process, Florence			
Green Seal-8	lb.	.0825/	.0850
Red Seal-9	lb.	.0775/	.08
White Seal-7	lb.	.0875/	.09
Kadox, Black Label-15	lb.	.065 /	.0675
No. 25	lb.	.0775/	.08
Red Label-17	lb.	.065 /	.0675
Horse Head Special 3	lb.	.065 /	.0675
XX Red-4	lb.	.065 /	.0675
23	lb.	.065 /	.0675
72	lb.	.065 /	.0675
78	lb.	.065 /	.0675
80	lb.	.065 /	.0675
103	lb.	.065 /	.0675
110	lb.	.065 /	.0675
St. Joe (lead free)			
Black Label	lb.	.065 /	.0675
Green Label	lb.	.065 /	.0675
Red Label	lb.	.065 /	.0675
U.S.P.	lb.	.0975/	.10
Zinc Sulphide Pigments			
Cryptone-BA-19	lb.	.05 /	.0525
BT	lb.	.05 /	.0525
CB	lb.	.05 /	.0525
MS	lb.	.0525/	.055
ZS No. 20	lb.	.075 /	.0775
36	lb.	.075 /	.0775
230	lb.	.075 /	.0775
800	lb.		
Sunolith	lb.	.0360/	.0385
Yellow			
Cadmolith (cadmium yellow), (400-lb. bbls.)	lb.	.50 /	.55
Du Pont dispersed	lb.	1.25 /	1.75
Powders	lb.	.135 /	2.75
Lemon	lb.		
Mapico	lb.	.0675	
Toners	lb.	2.50	
Dispersing Agents			
Bardex	lb.	.0395/	.042
Bardol	lb.	.0225/	.025
Darvan	lb.	.30 /	.39
Nevoll (drums, c.l.)	lb.	.0225	
Santomerse S	lb.	.11 /	.25
Fillers, Inert			
Asbestine, c.l.	ton	15.00	
Barytes	ton	30.00	/36.00
f.o.b., St. Louis (50-lb. paper bags)	ton	22.85	
off color, domestic	ton	21.50	/26.50
white, imported	ton		
Blanc fixe, dry, precip.	lb.	.03 /	.035
Calcene	ton	37.50	/43.00
Infusorial earth	lb.	.025 /	.03
Kalite No. 1	ton	24.00	/30.00
3	ton	34.00	/40.00
Kalvan	ton	121.00	
Magnesia, calcined, heavy	lb.	.04	
Carbonate, l.c.l.	lb.	.0725/	.095
Paradene No. 2 (drums)	lb.	.045	
Pyrax A	ton	6.00	/20.00
Whiting			
Columbia Filler	ton	9.00	/14.00
Suprex, white extra light	ton	45.00	
heavy	ton	45.00	
Witco, c.l.	ton	6.00	
Finishes			
Rubber lacquer, clear	gal.		
colored	gal.		
Starch, corn, pwd. 100 lbs.			
potato	lb.		
Talc	ton	.025 /	.035
Flock			
Cotton flock, dark	lb.	.10 /	.12
dyed	lb.	.40 /	.80
white	lb.	.11 /	.18
Rayon flock, colored	lb.	.75 /	1.50
white	lb.	.75 /	.85
Latex Compounding Ingredients			
Accelerator 85	lb.	.35	
89	lb.	1.40	
122	lb.	1.55	
552	lb.	2.50	
Aerosol OT Aqueous 10%	lb.	.15 /	.175
Antox, dispersed	lb.	.42	
Aquarex A	lb.	.35	
D	lb.	.75	
F	lb.	.85	
WA Paste	lb.	.28	
Areskap No. 50	lb.	.18 /	.24
100, dry	lb.	.39 /	.51
Aresket No. 240	lb.	.16 /	.22
300, dry	lb.	.42 /	.50
Aresklene No. 375	lb.	.35 /	.50
400, dry	lb.	.51 /	.65
Black No. 25, dispersed	lb.	.22 /	.40
Collocarb	lb.	.07	
Color Pastes, dispersed	lb.	.35	/ 1.90
Compound G-11 NW	lb.		
Dispersex No. 15	lb.	.11 /	.12
No. 20	lb.	.08 /	.10
Emo, brown	lb.	.16	
white	lb.	.16	
Factice Compound, dispersed	lb.	.19	
Factex Dispersion A	lb.		
Heliozone, dispersed	lb.	$0.25	
Igepon A	lb.		
Latac	lb.		
MICRONEX, Colloidal	lb.	.055	/$0.065
Nekal BX (dry)	lb.		
Pipsol X	lb.	3.05	/ 3.55
R-2 Crystals	lb.	2.50	/ 2.75
R-23	lb.	.40	
RN-2	lb.	2.00	/ 2.25
Crystals	lb.	2.00	/ 2.25
S-1 (400-lb. drums)	lb.	.65	
Santobrite Briquettes	lb.	.17 /	.26
Powder	lb.	.16 /	.26
Santomerse D	lb.	.41 /	.65
S	lb.	.11 /	.25
No. 1	lb.	.18 /	.35
No. 2	lb.	.18 /	.35
No. 3	lb.	.40 /	.65
No. 3P	lb.	.29 /	.45
Stablex A	lb.	.90 /	1.10
B	lb.	.65 /	.90
C	lb.	.40 /	.50
Sulphur, dispersed	lb.	.10 /	.15
No. 2	lb.	.075	
T-1 (400-lb. drums)	lb.	.40	
Tepidone	lb.	1.20	
Vulcan Colors	lb.		
Zinc oxide, dispersed	lb.	.12 /	.15
Mineral Rubber			
Black Diamond	ton	25.00	
B.R.C. No. 20	lb.	.009 /	.01
Hydrocarbon, hard	ton	23.00	
Genasco Hydrocarbon, granulated	ton		
solid	ton		
Gilsonite	ton		
Parmr	ton	23.00	/27.00
Pioneer	ton		
285°-300°	ton	23.00	/42.00
Mold Lubricants			
Lubrex	lb.	.25 /	.30
Mold Paste	lb.	.12 /	.18
Sericite	ton	65.00	/75.00
Soapbark	lb.		
Soapstone, l.c.l.	ton	25.00	/35.00
Oil Resistant			
AXF	lb.	.40 /	.50
Reclaiming Oils			
B.R.V.	lb.	.032 /	.0345
No. 1621	lb.	.019 /	.02
S.R.O.	lb.	.019 /	.02
X-159	gal.	.20	
Reenforcers			
Carbon Black			
Aerfloted Arrow Specification (bags only)	lb.	.02925†	
Arrow Compact Granulized	lb.	.02925†	
Certified Heavy Compressed (bags only)	lb.	.02925†	
Spheron	lb.	.02925†	
Continental, dustless	lb.	.02925†	
Compressed (bags only)	lb.	.02925†	
Disperso	lb.	.02925†	
Dixie	lb.	.02925†	
Dixiedensed	lb.	.02925†	
66	lb.	.02925†	
Excello, dustless	lb.	.02925†	
Fumonex	lb.	.03	
Gastex	lb.	.03 /	.07
Kosmobile	lb.	.02925†	
66	lb.	.02925†	
Kosmos	lb.	.02925†	
MICRONEX Beads	lb.	.02925†	
Mark II	lb.	.02925†	
Standard	lb.	.02925†	
W-5	lb.	.02925†	
W-6	lb.	.02925†	
P-33	lb.	.0475 /	.0725
Pelletex	lb.	.03 /	.07
Supreme, dustless	lb.	.02925†	
Thermax	lb.	.02 /	.0475
Velvetex	lb.	.029 /	.034
"WYEX BLACK"	lb.	.02925†	
Carbonex	lb.	.022 /	.035
S	lb.	.03 /	.0350
Clays			
Aerfloted Paragon (50-lb. bags)	ton	10.00	
Suprex (50-lb. bags)	ton	10.00	
Barden	ton	10.00	
Catalpo, c.l.	ton	30.00	
Chicora	ton	10.00	
China	ton	22.50	
Crown	ton	10.00	
Dixie	ton	10.00	/22.50
Hi-White	ton	10.00	
Langford	ton	8.50	
NcNamee	ton	10.00	/22.50
Par	ton	10.00	
Paraforce, c.l.	ton	40.00	
Witco, c.l.	ton	10.00	
Cumar EX	lb.	.045	
MH	lb.	.065 /	.11
V	lb.	.09 /	.12
Silene	lb.	.04 /	.045

†Price quoted is f.o.b. works (bags). The price f.o.b. works (bulk) is 2.75¢ per pound; f.o.b. Hoboken (bulk), 3.63¢; f.o.b. No. Atlantic Docks (bags), 3.80¢. All prices are carlot.

Reodorants			
Amora A	lb.		
B	lb.		
C	lb.		
D	lb.		
Compound G-4	lb.		
G-11	lb.		
Curodex 19	lb.	$2.75	
188	lb.	3.50	
Para-Dors	lb.	4.50	
Rodo No. 0	lb.	3.50	/$4.00
10	lb.	4.50	/ 5.00
198	lb.		
Rubber Substitutes			
Black	lb.	.08 /	.12
Brown	lb.	.08 /	.115
White	lb.	.085 /	.135
Factice			
Amberex	lb.	.25	
Type B	lb.	.1875	
Brown	lb.	.08 /	.13
Fac-Cel B	lb.	.135	
C	lb.	.135	
Neophax A	lb.	.09	
B	lb.	.09	
White	lb.	.085 /	.135
Softeners			
B.R.T. No. 7	lb.	.0165/	.0175
Bondogen	lb.	.98 /	1.25
Burgundy pitch	lb.	.06	
Cycline oil	gal.	.14 /	.20
Dispersing Oil No. 10	lb.	.0335/	.036
Nuba resinous pitch (drums)			
Grades No. 1 and No. 2	lb.	.0265	
Nubalene Resin	lb.	.025	
Nypene	lb.	.016 /	.0165
Palm oil (Witco), c.l.	lb.		
Palmol	lb.		
Para Flux	gal.	.17 /	.18
No. 2016	gal.	.15 /	.20
Para Lube	lb	.425 /	.48
Pine tar	gal.		
Plastogen	lb.	.0775/	.10
Plastone	lb.	.27 /	.30
R-19 Resin (drums)	lb.	.10	
21 Resin (drums)	lb.	.10	
Reogen	lb.	.115 /	.22
Rosin oil, compounded	gal.	.40	
RPA No. 1	lb.	.65	
2	lb.	.65	
3	lb.	.46	
Rubtack	lb.	.10	
Tackol	lb.	.083 /	.18
Tonox	lb.	.52 /	.61
Tonox D	lb.	.75 /	.85
Witco No. 20, l.c.l.	gal.	.20	
X-1 resinous oil (tank car)	lb.	.01	
Softeners for Hard Rubber Compounding			
Resin C. Pitch 45°C. M.P.	lb.	.013 /	.014
60°C. M.P.	lb.	.013 /	.014
75°C. M.P.	lb.	.013 /	.014
Solvents			
Beta-Trichlorethane	gal.		
Carbon bisulphide	lb.		
tetrachloride	lb.		
Cosol No. 1	gal.	.25 /	.30
No. 2	gal.	.20 /	.28
No. 3	gal.	.20 /	.28
Industrial 90% benzol (tank car)	gal.	.14	
Skellysolve	gal.		
Stabilizers for Cure			
Laurex (bags)	lb.	.1025/	.1275
Stearex B	lb.	.075 /	.085
Beads	lb.	.075 /	.085
Stearic acid, single pressed	lb.	.075 /	.085
Stearite, c.l. 100 lbs.		7.50	
Zinc stearate	lb.	.23 /	.25
Synthetic Rubber			
Neoprene Type E	lb.	.65	
G	lb.	.70	
GN	lb.		
GW	lb.	.75	
H	lb.	.78	
M	lb.	.65	
Latex Type 57	lb.	.30	
Synthetic 190	lb.	.55	
Tackifier			
B.R.H. No. 2	lb.	.017 /	.02
Varnish			
Shoe	gal.	1.45	
Vulcanizing Ingredients			
Sulphur 100 lbs.		2.00	
Chloride (drums)	lb.	.035 /	.04
Telloy	lb.	1.75	
Vandex	lb.	1.75	
(See also Colors—Antimony)			
Waxes			
Carnauba, No. 3 chalky	lb.		
2 N.C.	lb.		
3 N.C.	lb.		
1 Yellow	lb.		
2	lb.		
Montan, crude	lb.		

MACHINERY by THROPP

FOR TODAY'S REQUIREMENTS IN THE RUBBER INDUSTRY



20"x 22"x 60" Mill

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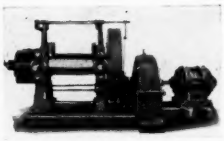
for Hard Continuous Service. Standard Sizes 60", 50", 42". Other Sizes Had on Request.



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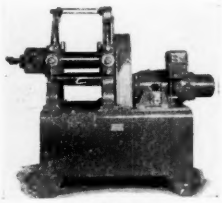
for Plastics and Rubber. Roller Bearing Drives. Standard Sizes 30" & 24".



6"x 12" Mill

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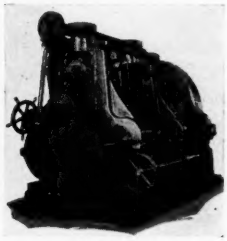
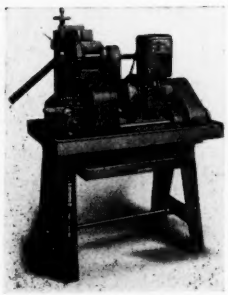
for All Types of Work. Wide Range of Sizes. Std. Size, 6x16, 6x12, 3x8, 2x6.



Calenders

CALENDERS

for Laboratory and Production. Custom-Built to Your Requirements.



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Regular and Special Constructions of

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Single Filling Double Filling and

ARMY

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Ducks

Drills

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Osnaburgs

Curran & Barry

320 BROADWAY

NEW YORK

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Aug. 31	Sept. 28	Oct. 5	Oct. 12	Oct. 19	Oct. 26
Oct.	9.29	9.58	9.64	9.47	....	....
Nov.	....	9.58	9.63	9.46	9.53	9.60
Dec.	9.25	9.57	9.62	9.45	9.48	9.54
Mar.	9.06	9.51	9.61	9.39	9.46	9.52
July	9.68	9.14	9.28	9.08	9.17	9.24
Sept.	....	....	....	....	8.89	8.97

COTTON futures prices, together with the spot price, ruled somewhat easier during October. After closing at 9.89¢ per pound on September 30, the New York $\frac{15}{16}$-inch spot middling price advanced to 9.95¢ per pound on October 5 and then was easier, closing lower at 9.76¢ October 22. Thereafter the market was steady, and the closing price on October 29 was 9.73¢ per pound.

Production of cotton from the crop of 1940 was estimated by the Crop Reporting Board of the Department of Agriculture as of October 1 to be 12,741,000 bales, a reduction of only 31,000 bales from the forecast of 12,772,000 bales as of September 1.

According to the Bureau of Census, 639,252 bales of cotton were consumed by domestic mills during September, a new high for that month. This figure compares with 654,503 bales in August and 624,183 bales in September, 1939.

During the first 10 weeks of the current crop year only a little over 200,000 bales of cotton were exported from this country; while in the corresponding period last year 1,267,000 bales were shipped. A new development in the export trade last month was the shipment of American cotton to Russia, which has been absent as a purchaser for several years. Great Britain is expected to cover the bulk of her cotton requirements over the next few months out of supplies received from this country under the barter deal.

The Department of Agriculture predicted that domestic consumption of 1940-41 cotton might total 8,250,000 to 8,750,000 bales, which would be above the record of almost 8,000,000 bales in the 1936-37 season. The prediction was based partly on anticipated large government purchases of textiles for the armed forces.

Fabrics

The market for fabrics continued active during October, with trading conducted on an orderly and steady basis. Fabrics of special construction have been in heavy demand, and production is reported to be sold well into the first quarter of 1941. The brisker demand for fabrics covers both nearby and future deliveries, and the trade looks for a gradually expanding market.

The market is strong, reflecting better demand, with the prices of most types of constructions in the following groups showing an advance over the previous month's quotations: drills, ducks, osnaburgs, raincoat fabrics, and sheetings. Hollands and tire fabrics are steady and unchanged. A continuation of activity at gradually advancing prices is anticipated by the trade through the balance of this year and early next year.

New York Quotations

October 28, 1940

Drills		
38-inch 2.00-yard	yd.	$0.11½
40-inch 3.47-yard		.07¾
50-inch 1.52-yard		.15¾
52-inch 1.85-yard		.14
52-inch 1.90-yard		.13⅝
52-inch 2.20-yard		.12¾
52-inch 2.50-yard		.11¼
59-inch 1.85-yard		.14
Ducks		
38-inch 2.00-yard D. F.	yd.	.11¾/.13
40-inch 1.45-yard S. F.		.16¼
51½-inch 1.35-yard D. F.		.19¼
72-inch 1.05-yard D. F		.27 /.27⅛
72-inch 17.21-ounce		.31
Mechanicals		
Hose and belting	lb.	.26¼
Tennis		
52-inch 1.35-yard	yd.	.17¾
Hollands		
Gold Seal and Eagle		
20-inch No. 72	yd.	.10
30-inch No. 72		.18
40-inch No. 72		.20
50-inch No. 72		.28
Red Seal and Cardinal		
20-inch	yd.	.08½
30-inch		.15¾
40-inch		.17
50-inch		.26
Osnaburgs		
40-inch 2.34-yard	yd.	.09⅜
40-inch 2.48-yard		.09¼
40-inch 2.56-yard		.09
40-inch 3.00-yard		.07¾
40-inch 7-ounce part waste		.08⅝
40-inch 10-ounce part waste		.11½
37-inch 2.42-yard		.09½
Raincoat Fabrics		
Cotton		
Bombazine 60 x 64	yd.	.08
Plaids 60 x 48		.11¾
Surface prints 60 x 64		.12¾
Print cloth, 38½-inch, 60 x 64		.05¼
Sheetings, 40-inch		
48 x 48, 2.50-yard	yd.	.08
64 x 68, 3.15-yard		.08¾
56 x 60, 3.60-yard		.07¾
44 x 40, 4.25-yard		.05½
Sheetings, 36-inch		
48 x 48, 5.00-yard	yd.	$0.04⅝
44 x 40, 6.15-yard		.04
Tire Fabrics		
Builder		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.29
Chafer		
14 ounce 60" 20/8 ply Karded peeler	lb.	.28½
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.28
Cord Fabrics		
23/5/3 Karded peeler, 1$\frac{1}{16}$" cotton	lb.	.29½
15/3/3 Karded peeler, 1$\frac{1}{16}$" cotton	lb.	.27½
12/4/2 Karded peeler, 1$\frac{1}{16}$" cotton	lb.	.26½
23/5/3 Karded peeler, 1¼" cotton	lb.	.35
23/5/3 Combed Egyptian	lb.	.48½
Lone Breaker		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.31

Rubber and Canvas Footwear Statistics

	Thousands of Pairs		
	Inventory	Production	Shipments
1938	16,183	50,812	54,942
1939	16,388	60,612	60,377
1940			
Jan.	15,018	5,044	6,389
Feb.	15,319	5,062	4,761
Mar.	15,656	4,869	4,532
Apr.	16,881	5,128	3,902
May	18,095	5,075	3,862
June	18,886	4,521	3,737
July	17,641	3,323	4,567
Aug.	16,386	4,583	5,808

The above figures have been adjusted to represent 100% of the industry based on reports received which represented 81% for 1936-37.
Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Factex

(*Continued from page* 51)

rubber without influencing the physical properties of the product, and up to 30% on the rubber when tensile properties are not of primary importance, it is claimed. Use of the dispersion in latex is said to produce a dry, non-tacky surface with a "velvet" feel. The brown color of Factex Dispersion, which restricts its use to colored goods, will produce an amber transparent stock without additional coloring matter. The slight hydrogen sulphide odor of the dispersion is said to disappear completely after storage of the goods.

World Net Imports of Crude Rubber—Long Tons

Year	U.S.A.	U.K.†	Argentine	Australia	Belgium	Canada	France	Greater Germany‡	Italy	Japan	Poland	Sweden	U.S.S.R.	Rest of World	Total
1938...	406,300	168,172	7,700	12,300	11,300	25,700	58,100	107,900	28,200	46,300	7,900	8,300	26,800	49,200	928,000
1939...	486,348	70,800¶	9,552	15,426	9,593	32,508	33,751§	62,344§	12,582§	42,351	5,415§	7,965a	14,000*	61,866	603,842¶
1940															
Jan. ..	71,541	....	1,049	921	891	5,047	....	....	....	4,547	....	....	....	....	....
Feb. ..	41,797	....	565	1,846	694	3,508	....	....	....	5,243	....	....	....	....	....
Mar. ..	58,283	....	756	1,784	....	3,062	....	....	....	6,057	....	....	....	....	....
Apr. ..	70,135	....	606	1,612	....	3,096	....	....	....	2,000*	....	....	....	....	....
May ..	50,621	....	589	2,100	....	3,108	....	....	....	2,500*	....	....	....	....	....
June ..	53,266	....	543	1,181	....	1,062	....	....	....	3,000*	....	....	....	....	....
July ..	....	....	500*	1,902	....	5,112	....	....	....	3,000*	....	....	....	....	....

*Estimated, and to Aug. 31, 1939, only. †U. K. figures show gross imports, not net imports. ‡Including imports of Austria and Czechoslovakia. ¶Up to Aug. 31, 1939, only. §Up to July 31, 1939, only. aUp to Sept. 30, 1939. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

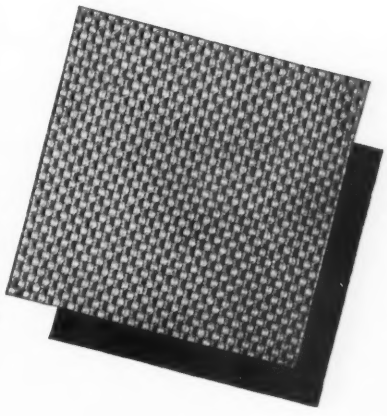
Drawn from a photograph of Blanket Weaving in the Highlands of Peru.

Down in the highlands of Peru, most people do their own weaving. Probably because it's just one of many chores to be done, there has been little change in methods or equipment for generations. Not so in a vast textile industry like ours. The 20 modern mills we represent have at their disposal a completely equipped and competently staffed research department second to none in the field of cotton textiles, as well as an experienced engineering department.

Through our engineering department comes information on all new machinery and equipment, and suitable selection is made to meet the special needs of each mill.

Through our research organization with its fine laboratory come refinements in processes and product development to suit needs of users.

Thus, our equipment and our products benefit by continuous studies maintained under the direction of scientists.



FOR INSTANCE:

Warwick Balloon Cloth

This division of our business affords one spectacular example of product improvement resulting from *applied* scientific research. Our famous Balloon Cloth is in a class by itself for consistent outstanding performance under the rigid tests applied to fabrics of this type. The services of our engineering and research departments are available for the solution of special problems arising out of new developments in the Rubber Industry.

WELLINGTON SEARS COMPANY, 65 Worth Street, New York, N. Y.

. . . IT CAN NOW BE EQUIPPED WITH AUTOMATIC CONTROL

NEW — and more valuable than ever. For the past 13 years The Schuster Calender Gauge has proven itself an outstanding and indispensable instrument in the rubber industry. *Now* it automatically adjusts your rolls to a predetermined thickness and correctly maintains that thickness. Coatings for tire fabric and similar uses are kept accurate and uniform *automatically*. The result is a better product at a lower cost. Write us today for complete particulars.

THE MAGNETIC GAUGE COMPANY
60 EAST BARTGES STREET AKRON, OHIO
Eastern States Representative—
BLACK ROCK MANUFACTURING CO., Bridgeport, Conn.

ZOPAQUE
Pure Titanium Dioxide

Acknowledged the
MOST *Effective*
of all white opacifiers!

Chemically pure, stable, inert.

Try It!

Sole Selling Agents:
The Chemical & Pigment Company
Baltimore, Md. · Collinsville, Ill. · Oakland, Calif.
Manufactured by
American Zirconium Corporation
Baltimore, Maryland

Shipments of Crude Rubber from Producing Countries—Long Tons

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Thailand	French Indo-China	Total	Philippines and Oceania	Liberia†	Nigeria (incl. Brit. Cameroons)	Other Africa	South America	Mexican Guayule	Grand Total
1938	372,000	298,100	49,500	8,500	6,700	9,500	17,800	41,600	59,200	862,900	2,000*	2,900	3,100	5,900*	15,300	2,800	894,900
1939	376,755	372,046	61,028	9,241	6,616	11,864	24,014	41,753	65,219	968,536	2,079*	5,435	2,824	6,600*	16,094	2,861	1,004,429
1940																	
Jan.	26,229	54,148	7,698	839	833	1,858	2,256	5,722	5,238	104,821	185	1,191	147	600	1,550	389	108,883
Feb.	45,651	37,958	8,946	2,030	892	1,164	2,678	4,307	6,931	110,557	94	477	234	600	1,662	239	113,863
Mar.	47,885	42,355	5,305	1,070	871	1,050	3,526	3,111	3,551	108,724	178	548	343	600	1,482	365†	112,240
Apr.	25,454	44,416	4,148	817	990	1,799	2,951	1,834	2,927	85,336	203	598	120	600	1,159	314†	88,330
May	57,874	40,436	7,341	972	1,046	1,370	2,696	2,582	4,578	118,895	195	364	200*	600	2,305	288†	123,008
June	45,471	44,750	5,603	1,184*	712	1,421	4,077	2,178	2,730	108,126	200*	600*	200*	600	1,080	200*	111,006
July	42,861	60,468	7,329	1,257*	310	1,767	2,494	4,253	4,000*	124,739	200*	600*	200*	600	1,036	200*	127,575
Aug.	45,872	45,045	8,137	1,257*	75	1,593	2,640	4,545	7,500*	116,664	200*	600*	200*	600	1,233	200*	119,697

* Estimated. †Guayule rubber imports into U.S.A. provisional until export figures from Mexico are received. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Imports by Customs Districts

	August, 1940 *Crude Rubber Pounds	August, 1940 *Crude Rubber Value	August, 1939 *Crude Rubber Pounds	August, 1939 *Crude Rubber Value
Massachusetts	12,310,875	$2,184,387	9,832,917	$1,602,341
St. Lawrence	.....	.....	7,183	1,291
Buffalo	.....	.....	26,250	2,850
New York	122,747,715	21,759,118	55,510,142	8,972,504
Philadelphia	5,780,178	936,494	1,176,108	178,732
Maryland	2,382,960	401,868	2,964,959	448,159
Virginia	.....	.....	41,627	6,467
Georgia	.....	.....	885,924	125,843
Mobile	2,754,448	453,277	705,390	100,461
New Orleans	8,567,697	1,408,945	7,682,906	1,124,076
Galveston	201,785	34,929	44,900	6,648
El Paso	88,300	7,660	.....	.....
Los Angeles	7,754,341	1,332,381	6,177,176	962,214
San Francisco	347,404	63,173	1,228,225	188,796
Oregon	.....	.....	16,800	2,662
Michigan	.....	.....	18,421	2,681
Chicago	.....	.....	112,000	16,852
Ohio	311,820	51,488	450	62
St. Louis	.....	.....	65	19
Colorado	336,000	57,158	.....	.....
Totals	163,583,523	$28,690,878	86,431,443	$13,742,658

*Crude rubber including latex dry rubber content.

Dividends Declared

Company		Stock	Rate	Payable	Stock of Record
Armstrong Cork Co.		Com.	$0.25 interim	Dec. 2	Nov. 4
Armstrong Cork Co.		Pfd.	$1.00 q.	Dec. 16	Nov. 30
Canada Wire & Cable Co., Ltd.		"B"	$0.50 interim	Dec. 15	Nov. 30
Canada Wire & Cable Co., Ltd.		"B"	$0.50 irreg.	Dec. 15	Nov. 30
Canada Wire & Cable Co., Ltd.		Pfd.	$1.625 q.	Dec. 15	Nov. 30
Collyer Insulated Wire Co.		Com.	$0.30 irreg.	Oct. 1	Sept. 21
Crown Cork & Seal Co., Ltd.		Com.	$0.50 q.	Nov. 15	Oct. 31
Dayton Rubber Mfg. Co.		Com.	$0.25	Oct. 25	Oct. 11
Dayton Rubber Mfg. Co.		"A"	$0.50 q.	Oct. 25	Oct. 11
De Vilbiss Co.		Com.	$1.00 irreg.	Oct. 15	Sept. 30
De Vilbiss Co.	7%	Pfd.	$0.175 q.	Oct. 15	Sept. 30
Detroit Gasket & Mfg. Co.		Pfd.	$0.30 q.	Dec. 2	Nov. 15
General Cable Corp.		Pfd.	$1.75 accum.	Nov. 1	Oct. 28
General Electric Co.		Com.	$0.35 q.	Oct. 25	.....
Goodyear Tire & Rubber Co.		Com.	$0.25	Dec. 16	Nov. 15
Goodyear Tire & Rubber Co.		Pfd.	$1.25 q.	Dec. 16	Nov. 15
Lea Fabrics, Inc.		Com.	$0.75 irreg.	Nov. 1	Oct. 18
Midwest Rubber Reclaiming Co.		Com.	$1.75	Oct. 28	Oct. 15
Okonite Co.		Com.	$1.50 q.	Nov. 1	Oct. 22
Okonite Co.		Pfd.	$1.50 q.	Dec. 2	Nov. 15
Pahang Rubber, Ltd.		Com.	$0.15	Sept. 28	Sept. 21
S. S. White Dental Mfg. Co.		Com.	$0.15 q.	Nov. 16	Nov. 1

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
Bold face type $1.25 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.00 per line (eight words)

Allow nine words for keyed address. *Replies forwarded without charge*

SITUATIONS WANTED

YOUNG CHEMIST WITH EXPERIENCE IN FOOTWEAR, SOLES, heels, sponge and neoprene compounding. Ability to follow the product from laboratory development to successful factory processing. Address Box No. 162, care of INDIA RUBBER WORLD.

CHEMIST, AGE 30, WITH 8 YEARS' EXPERIENCE IN development, research, production, and sales engineering; all plant and laboratory procedures; knowledge of latex, ability to handle men; desires position as salesman rubber chemicals, superintendent, or compounder. Excellent reference. Address Box No. 164, care of INDIA RUBBER WORLD.

CHEMICAL ENGINEER, M.I.T. 1937, LACQUER EXPERIENCE, seeks position chemical or allied field. Age 26. Single. Locate anywhere in United States. Address Box No. 171, care of INDIA RUBBER WORLD.

RUBBER CHEMIST, ELEVEN YEARS' EXPERIENCE WITH large and small companies in compounding and processing rubber goods and all synthetics, here and abroad. Good experience with latex, airfoam sponge, cushions, and dipped goods. Available on short notice. Location immaterial, also South America. Excellent references. Practical man. 37 years old. Address Box No. 173, care of INDIA RUBBER WORLD.

20 YEARS' EXPERIENCE RUNNING A RUBBER GOODS PLANT—College graduate, capable chemist, executive type, thoroughly familiar with solid and sponge rubber goods, chemistry, compounding, development, manufacturing processes, cost estimates, plant organization. Age 43, married, desires responsible position. Address Box No. 174, care of INDIA RUBBER WORLD.

SPONGE RUBBER SPECIALIST, COLLEGE GRADUATE, CHEMist, wide experience in operating procedures OFFERS HIS SERVICES TO RUBBER PLANTS DESIRING TO ADD THE LUCRATIVE SPONGE RUBBER PRODUCTS to their manufacturing program. Experienced also in mechanical solid rubber goods. Address Box No. 175, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

RUBBER CHEMIST—MUST BE ABLE IN COMPOUNDING AND understand production and supervision. Must have intimate knowledge of general mechanicals, drug sundries, and sponge rubber products. Must also be able to figure and estimate costs. Give full details. Address Box No. 163, care of INDIA RUBBER WORLD.

WANTED: RUBBER BAND PRODUCTION ENGINEER from crude to finished stationery bands. State qualifications. Address Box No. 165, care of INDIA RUBBER WORLD.

SALESMAN WANTED: MEDIUM SIZE, WELL EQUIPPED NEW Jersey Rubber Plant wants salesman with personal following on molded specialties, tubing, and lathe cut goods. Please state full details in letter, which will be kept confidential. Include salary expected. Address Box No. 168, care of INDIA RUBBER WORLD.

WANTED: PRODUCTION SUPERINTENDENT, TO EQUIP, ORganize, and manage a mechanical rubber molding department on modest scale for successful manufacturer in New York area; preferably a man having an Engineering Degree and with a background of suitable experience. Address Box No. 169, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

ROYALTIES PAID
ON ROLL IMPROVEMENTS

A long-established Massachusetts concern specializing in the manufacture of wood, metal, and rubber rolls will pay royalties for exclusive manufacturing and sales rights on roll improvements. Address Box No. 161, care of INDIA RUBBER WORLD.

PRESS WORK WANTED. FORTY HYDRAULIC PRESSES, 36" platen, available at once to do all types of press work on contract. Can furnish labor and compounds. Location: Brooklyn. Address Box No. 172, care of INDIA RUBBER WORLD.

INTERNATIONAL PULP CO.
41 Park Row, NEW YORK, N. Y.
SOLE PRODUCERS
ASBESTINE
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AIR BAG BUFFING MACHINERY
STOCK SHELLS HOSE POLES
MANDRELS
NATIONAL SHERARDIZING & MACHINE CO.
868 WINDSOR ST. HARTFORD, CONN.
Representatives
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GUAYULE RUBBER
Washed and Dry, Ready for Compounding
PLANTATION RUBBER
From Our Own Estates in Sumatra
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745 Fifth Avenue New York

BROCKTON TOOL COMPANY
Central Street QUALITY MOULDS FOR ALL PURPOSES South Easton, Mass.
THE FIRST STEP — A QUALITY MOULD

AN APPROVED CLAY
CROWN CLAY
SOUTHEASTERN CLAY COMPANY
AIKEN, SOUTH CAROLINA

(*Advertisements continued on page 87*)

!!$275,000.00 PLANT GOES "UNDER THE HAMMER"!!

BY ORDER OF THE OWNER WE WILL SELL AT

ABSOLUTE PUBLIC AUCTION

RUBBER MILL, LABORATORY TESTING and MACHINE SHOP EQUIPMENT

OF THE

OVERMAN TIRE COMPANY

151 CORTLANDT ST. **BELLEVILLE, NEW JERSEY**

TUESDAY NOVEMBER 19th, 1940 at 10:30 A.M.

COMPRISING:

RUBBER MILL:

Mixing Mills:

4—60" x 20" THROPP MIXERS, complete with reduction drives and direct coupled to 150 h.p. motors and controls.

4—42" x 16" THROPP MIXERS, complete with reduction drive and direct coupled to 60 h.p. motors and controls.

Calenders:

1—66" x 24" ALLEN THREE ROLL CALENDER, power elevation, direct motor driven thru reduction drive, with D.C. motor and distribution panel, with 3 roll cooling drum.

1—42" BIRMINGHAM THREE ROLL CALENDER, direct connected to 40 h.p. motor.

2—24" THROPP THREE ROLL CALENDERS, direct connected motor drive with General Electric 15 h.p. motor.

Tube Machines:

1—No. 6 NATIONAL TUBING MACHINE, 6" capacity, direct connected to 80 h.p. 230 volt D.C. motor and control equipment, complete with belt conveyors, scales and cooling tanks.

1—No. 1 ROYLE TUBING MACHINE, complete with Festoon and Banner Bead Builder, all direct motor driven.

— also —

1—20" x 20" Thropp Hydraulic Press; 1—24" x 16" Thropp Washer; 1—International Dough Mixer; 8—Southwark Pot Heaters; 3—Aron Williams Repair Cores; 1—Metal Liner Reroll Table; 1—National Giant Vacuum Boxes; D'Mattia Air Bag Extractors; National Watch Case Vulcanizers; Laminating Machines; Hydraulic Rubber Appliers and Cutters; Weighing Scales, etc.

1—DYNAMOMETER TESTING APPARATUS for testing fatigue of rubber tires built by General Electric, patterned from U. S. Bureau of Standards.

1—SPRAGUE ELECTRIC DYNAMOMETER with 13 h.p. motor 275-340 r.p.m., Serial No. 1411337, 45 volt; and General Electric 10.6 H.P. Generator, 140-160 r.p.m., Serial No. 1411338, and complete D.C. panel board with switches and starting equipment.

1—GENERAL ELECTRIC DYNAMOMETER with 30 H.P. G. E. Motor, 125-375 r.p.m., Serial No. 1437645, 250 volt, and General Electric 25 h.p. generator 75-180 r.p.m., Serial No. 1437644, 250 volt, with complete D.C. panel board and switches and pressure gauges, with Leeds and Northrup Potentiometer.

TIRE BUILDING DEPT.:

4—NATIONAL RUBBER MACHY. COMPANY CORE BUILDING MACHINES, style No. 30C, with air stitchers, tread centering and rollering devices, all individually motor driven.

3—BANNER DRUM TIRE BUILDING MACHINES, individually motor driven.

1—BANNER MANUALLY OPERATED BIAS CUTTER, motor driven cutter, and take-off winder.

— also —

3—Utility Band Builders, direct motor driven; 6—Heavy Duty Power Bucks, motor driven; Utility Bead Flipper, Banner Stock Turrets and an assortment of drums for tire building, tire racks, assortment of cores and bead forming rings; Brannick Model B Tire Spreaders; Gray Mfg. Company Precision Buffer; Double End Buffer, etc., etc.

LABORATORY:

16" x 6" THROPP LABORATORY MIXER, direct geared motor driven with controls.

SCOTT RUBBER TESTER, testing capacity up to 10,000 lbs. with 1/4 h.p. motor.

SCOTT SINGLE CORD TESTER, Scale Range 0 to 50 lbs., with 1/4 h.p., 110 volt motor.

Louis Schopper Detrition Machine.

Grassille Abrader, motor driven.

— also —

Freas Electric Oven, Randall and Stickney Gauge; Cambridge Hand Pyrometer; Chemicals and Compounds.

POWER HOUSE:

Air Compressors and Motor Generator Sets

Boilers:

1—225 H.P. LESLIE & ELLIOT H.R.T. BOILER, with Westinghouse Single Retort Stoker, automatically controlled with motor driven blower system.

Air Compressors:

1—AMERICAN FAIRHURST AIR COMPRESSOR, 12 1/4" x 10", arranged for motor drive with 75 h.p. motor.

1—PENNSYLVANIA TWO-STAGE AIR COMPRESSOR, 10" x 9" x 2 3/4", 225 lb. air pressure.

Pumps:

Pennsylvania Vacuum Pumps; Davidson Low Pressure Pumps; Worthington Sump Pumps; Worthington Boiler Feed Water Pumps.

Motor Generator Sets:

1—200 H.P. WOOD MOTOR GENERATOR SET, complete with distribution panel board, direct coupled to 2—60 k.w. G.E. generators, 120 volts.

1—15 K.V.A. GENERAL ELECTRIC MOTOR GENERATOR SET, with 25 h.p. G.E. motor and controls.

MACHINE SHOP:

1—54" COLBURN VERTICAL BORING MILL, power rapid traverse, individual gear boxes, arranged for self-contained motor drive with motor and controls.

1—44" NILES BEMENT POND VERTICAL BORING MILL, individual gear box drive, arranged for single pulley drive thru gear box complete with motor and control.

1—18" x 8' SIDNEY ENGINE LATHE, quick change gear, power feed to carriage and cross slide, complete lathe equipment.

1—14" x 6' HENDEY YOKE HEAD ENGINE LATHE, quick change gear, power feed to carriage and cross slide, complete lathe equipment with draw-in bar and collets.

1—21" SMITH & MILLS SHAPER, back geared, 12" swivel vise.

1—25" CINCINNATI UPRIGHT DRILL PRESS, back geared, power feed, self contained countershaft drive.

2—AVEY HIGH SPEED DRILL PRESSES, tight and loose pulley drive.

1—18" CINCINNATI PLAIN MILLING MACHINE, power feed to table, complete with countershaft.

1—ZEH & HAHNEMAN INCLINABLE POWER PRESS, 2 1/2" stroke, flywheel type.

1—REED PROFILING MACHINE, 2 heads, gear drive with countershaft.

1—CHARLES ELMES HYDRAULIC PRESS, 325 ton capacity, complete with air tank, arranged for single pulley motor drive.

— also —

Hack Saw; Cold Saw; U. S. Electric Double End Grinders; Layout Table; large assortment of Milling Cutters, Drills, Stocks and Dies, Chain Hoists, Air Hoists, I-Beams, Vises, Electric Time Clocks, Transformers, large assortment of Motors, Hydraulic Trucks and Platforms, Carosol and Straight Link Belt Conveyors, Blower Installations, Circulating Water System Installation, Auto Call System, AND HUNDREDS OF OTHER ITEMS TOO NUMEROUS TO MENTION.

COMPLETE TIRE MOULDS FOR THE MANUFACTURE OF ALL SIZES OF BALLOON TIRES FROM 4421 THRU 1200-24", ALL HIGH PRESSURE MOULDS FROM 30 x 5 THRU 42 x 9. SOLID TIRE EQUIPMENT FROM 30 x 3 1/2 THRU 40 x 16 COMPLETE WITH RING AND AIR BAG MOULDS.

ALL MACHINERY MOTOR DRIVEN WITH A.C. AND D.C. CURRENT

INSPECTION: NOVEMBER 11th TO DAY OF SALE—REPRESENTATIVE ON PREMISES

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Classified Advertisements

Continued

MACHINERY AND SUPPLIES FOR SALE

LIQUIDATING: Complete Hydraulic System with High and Low pressure pumps and accumulators, located at Buffalo Plant; send for illustrated list; also 1—60″ Mill; #3 Banbury Mixer; 7—Triplex Hydraulic Pumps, 18 to 35 GPM, 1500 to 3000 lbs. per square inch; also Mills, Calenders, Tubers, Hydraulic Presses, etc. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: ANOTHER COMPLETELY REBUILT Number 9 Banbury Mixer. All vital parts restored and hard-surfaced. Ready for immediate shipment complete with motor, control, all accessories, etc. INTERSTATE WELDING SERVICE, 914 Miami St., Akron, Ohio.

FOR SALE: ONE 68 H.P. BERTHOLD ELECTRIC MOTOR, 220 Volts, 208 Amps., 300 R.P.M. In Akron, O. Address Box No. 166, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

WANTED BY MANUFACTURER: 1—60″ HEAVY duty mill and 1—42″ Cameron Slitting Machine. Address Box No. 167, care of INDIA RUBBER WORLD.

WANTED FOR USER: 1—NO. 3 OR NO. 9 BANBURY MIXER; 3—Mills; 1—Calender; 5—Hydraulic Presses, with pumps and accumulators; 2—Tubers. No dealers. Address Box No. 170, care of INDIA RUBBER WORLD.

EDWARD FOX
Consulting Technologist
RUBBER LATEX
294 Washington St. Boston, Mass.

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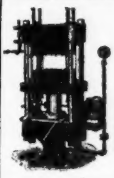
Our staff of chemists, engineers and bacteriologists with laboratories for analysis, research, physical testing and bacteriology are prepared to render you
Every Form of Chemical Service
305 Washington Street Brooklyn, N. Y.

SPECIALIZING IN **USED MACHINERY** FOR THE **RUBBER** AND ALLIED INDUSTRIES
ERIC BONWITT — AKRON, OHIO

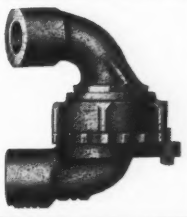


PLASTICS MOLDING PRESSES
Plain or Semi-automatic—Any Size or pressure—Pumps, Valves, etc.
Dunning & Boschert Press Co., Inc.
336 W. WATER ST. SYRACUSE, N. Y.

New Rubber Spreaders, Churns, Pony Mixers, Saturators.
Used — Rebuilt — Rubber — Chemical — and Paint Machinery.
LAWRENCE N. BARRY
41 Locust Street Medford, Mass.

MECHANICAL MOLDED RUBBER GOODS
Sponge Rubber: Sheeted—Die Cut—Molded
We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
SANDUSKY, OHIO

FLEXO
FLEXO JOINTS
Reasonable in price—extremely low maintenance cost
FLEXO SUPPLY COMPANY, 4218 Olive Street, St. Louis



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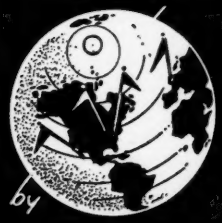

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This is BEAD CHAIN*, ingeniously and efficiently adapted to many products, as for example, to hold screw caps to hot water bags.

BEAD CHAIN*

It is decorative and strong, and made of various metals, including Monel, with natural or plated finishes, and in bead diameters up to ⅜ inch.

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*Reg. U. S. Pat. Off. 52 Mt. Grove St., Bridgeport, Conn.

The CARTER BELL MFG CO

CARTER BELL STANDARD SINCE 1903 RUBBER SUBSTITUTES

Springfield New Jersey

Rubber Questionnaire—2nd Quarter, 1940*

	Long Tons			
	Inventory at End of Quarter	Production	Shipments	Consumption
RECLAIMED RUBBER				
Reclaimers solely (6)	8,224	18,464	17,808	.....
Manufacturers who also reclaim (18)	7,467	18,309	2,424	17,558
Other manufacturers (120)	8,108	.....	.....	14,667
Totals	23,799	36,773	20,232	32,225

	Long Tons		
SCRAP RUBBER	Inventory	Consumption	Due on Contracts
Reclaimers solely (6)	33,765	18,140	21,707
Manufacturers who also reclaim (15)	38,923	21,704	18,476
Other manufacturers (13)	197	.....	.....
Totals	72,885	39,844	40,183

Tons of Rubber Consumed in Rubber Products and Total Sales Value of Shipments

PRODUCTS	Rubber Consumed Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Accessories		
Passenger car, truck, and bus casings	70,106	$92,614,000
Inner tubes for passenger cars, trucks, and buses	10,716	11,397,000
Farm tractor and implement casings and tubes	3,025	3,681,000
Airplane tires and tubes	120	401,000
Motorcycle casings and tubes	93	103,000
Bicycle tires, including juvenile pneumatics (single tubes, casings and tubes)	554	1,382,000
Solid and cushion tires for highway transportation	37	86,000
All other solid and cushion tires	128	410,000
Tire sundries and repair materials	2,426	2,906,000
Totals	87,205	$112,980,000
OTHER RUBBER PRODUCTS		
Mechanical rubber goods	9,593	$33,618,000
Boots and shoes	3,557	8,332,000
Insulated wire and cable compounds	1,758	†
Druggists' sundries, medical and surgical rubber goods	731	2,509,000
Stationers' rubber goods	539	855,000
Bathing apparel	186	986,000
Miscellaneous rubber sundries	515	1,547,000
Rubber clothing	98	484,000
Automobile fabrics	77	288,000
Other rubberized fabrics	884	2,958,000
Hard rubber goods	955	2,553,000
Heels and soles	2,498	4,734,000
Rubber flooring	353	652,000
Sponge rubber	1,857	2,816,000
Sporting goods, toys, and novelties	570	1,791,000
Totals	24,171	$64,123,000
Grand totals—all products	111,376	$177,103,000

Inventory of Rubber in the United States and Afloat

	Long Tons	
	Crude Rubber on Hand	Crude Rubber Afloat
Manufacturers	74,231	26,694
Importers and dealers	21,108	80,646
Totals	95,339	107,340

*Number of rubber manufacturers that reported data was 192; crude rubber importers and dealers, 49; reclaimers (solely), 6; total daily average number of employes (reporting manufacturers and reclaimers), 138,889.

It is estimated that the reported grand total crude rubber consumption is 75.1%; grand total sales value, 75%; the grand total crude rubber inventory, 56.7%; afloat figures, unavailable; the reclaimed rubber production, 72.5%; reclaimed consumption, 68.7%; and reclaimed inventory, 81.3% of the total of the entire industry.

†Owing to the difficulty of securing representative sales figures this item has been discontinued.

Compiled from R.M.A. statistics.

Rubber Trade Inquiries

The inquiries below are of interest not only in showing the needs of the trade, but because additional information may be furnished by readers. The Editor is glad to have those interested communicate with him.

No.	INQUIRY
2796	Manufacturers of tools and dies for making soft rubber molds.
2797	Manufacturers of molds for making rubber toys.
2798	Suppliers of crepe rubber strips.
2799	Manufacturers of oilskin clothing.
2800	Manufacturer of small red rubber tube known as Glantz E-Z Filler.
2801	Manufacturers of hard rubber disks ½-inch in diameter and 1/32-inch thick.
2802	Manufacturers of rubber footwear.
2803	Manufacturers of rubber bands for sealing tin cans.
2804	Manufacturers of false-face rubber masks.
2805	Manufacturers of beauty masks.
2806	Supplier of liquid rubber that can be poured into molds and harden without aid.

TIRE MOLDS

AND MOLDS FOR RUBBER SPECIALTIES AND MECHANICAL GOODS

machined in a large modern shop at low prices by specialists in the field. We also build special machinery to your drawings.

Submit inquiries for low quotations.

THE AKRON EQUIPMENT CO.
AKRON - OHIO

There's your man, Boys!

Uncover the thief who is padding your costs . . . milking your profits. Let the Stanley "laboratory detective" discover for you the finish which really 'fits" your product . . . meets your every requirement at minimum cost. It will cut finishing time, reduce finishing expense, increase the salability of your product . . . and your PROFITS! Call in the Stanley "laboratory detective" TODAY. He always (well, almost always) gets his man. And there is no obligation. Address Department J.

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EAST BERLIN CONNECTICUT
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A SUBSIDIARY OF THE STANLEY WORKS NEW BRITAIN CONN.

TO PRODUCERS OF RUBBER FOOTWEAR

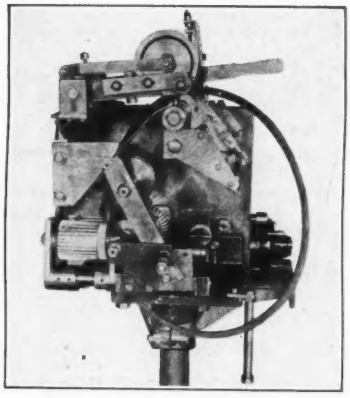
We are exclusive manufacturers of the Patten Air Lift Motor driven machine for cutting taps and soles from sheet rubber. This machine will cut from 3,500 to 5,000 pairs per day, producing a sole or tap with beveled edge of 27° to 90°, and is an up-to-date type of machine for this purpose.

We are now placing in the hands of our customers a new type of the above machine to which we have given the name of "Heavy Duty" designed to meet the demand for a machine capable of cutting thicker stock in Sole and Heel; using a 2 H.P. motor and a larger cylinder and piston which increase the pressure 80%. A taper clutch adds greatly to the power produced, and an improved blade gives better results in cutting the heavier stock. Although designed for heavy service, this machine is equally successful in cutting thinner stock for light shoes.

We are in position to make delivery of either type within thirty days after receipt of order.

WELLMAN COMPANY
Machinists
MEDFORD, MASS., U. S. A.

Utility Crimper Type Flipper *for* Truck and Large Balloon Tires



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Cudahy, Wisconsin

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SEVILLE, OHIO

Largest Exclusive Manufacturers of
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ALL STEEL ALL WELDED
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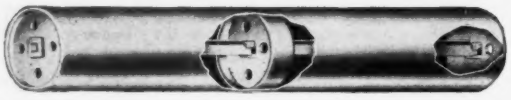

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Besides our well known Standard and Heavy Duty Constructions, we can supply light weight drums made up to suit your needs.
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HOSE BRAIDERS

We manufacture machinery for braiding hose with cotton or wire as used on Automotive Hydraulic Brakes; also for Air, Steam, Water, Pressure Greasing, and Vacuum Cleaning.

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Manufactured by
BROOKLYN COLOR WORKS, INC.
Morgan and Norman Avenues Brooklyn, N. Y.

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	July, 1940 Quantity	July, 1940 Value	Seven Months Ended July, 1940 Quantity	Seven Months Ended July, 1940 Value
UNMANUFACTURED—*Free*				
Liquid latex (solids)....*lb.*	5,109,739	$993,411	47,219,851	$8,962,761
Jelutong or pontianak....*lb.*	752,419	115,599	7,483,652	1,049,513
Balata ....*lb.*	145,757	20,553	797,827	137,115
Gutta percha ....*lb.*	340,837	56,371	2,590,952	410,876
Guayule ....*lb.*	587,173	53,058	4,558,573	430,239
Scrap and reclaimed....*lb.*	1,272,554	34,605	5,716,113	111,246
Totals	8,208,479	$1,273,597	68,366,968	$11,101,750
Misc. rubber (above), 1,000 *lbs.*	8,208	$1,273,597	68,367	$11,101,750
Crude rubber ....1,000 *lbs.*	149,924	26,426,632	889,869	154,872,917
Totals ....1,000 *lbs.*	158,132	$27,700,229	958,236	$165,974,667
Chicle, crude ....*lb.*	153,029	$47,731	7,931,177	$2,583,429
MANUFACTURED—*Dutiable*				
Rubber tires ....*no.*	620	$2,768	31,521	$192,968
Rubber boots, shoes and overshoes ....*prs.*	2,792	571	62,196	16,083
Rubber soled footwear with fabric uppers ....*prs.*	150,230	26,903	729,946	138,835
Golf balls ....*no.*	96,080	8,319	519,118	47,972
Lawn tennis balls....*no.*	38,184	3,533	895,701	87,897
Other rubber balls....*no.*	121,565	3,955	1,210,349	42,772
Other rubber toys....	.....	1,701	.....	19,060
Hard rubber combs....*no.*	.....	.....	.....	.....
Other manufactures of hard rubber	.....	8,830	.....	21,829
Friction or insulating tape..*lb.*	12,846	4,290	47,000	27,688
Belts, hose, packing, and insulating material	.....	2,638	.....	57,325
Druggists' sundries of soft rubber	.....	2,256	.....	26,000
Inflatable swimming belts, floats, etc. ....*no.*	6,224	716	426,771	28,883
Other rubber and gutta percha manufactures	.....	12,703	.....	196,558
Totals	.....	$79,183	.....	$903,870

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber ....*lb.*	224,482	$49,828	11,940,298	$2,394,666
Balata ....*lb.*	3,602	1,530	260,432	80,370
Other rubber, rubber substitutes and scrap....*lb.*	1,100	226	166,513	23,000
Rubber manufactures (including toys)	.....	1,196	.....	28,529
Totals	.....	$52,780	.....	$2,526,565

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed ....*lb.*	743,339	$36,246	15,558,081	$793,960
Scrap ....*lb.*	3,095,680	42,612	45,937,387	825,533
Cements ....*gal.*	31,667	41,683	268,362	345,303
Rubberized auto cloth.*sq. yd.*	24,763	9,692	155,338	69,809
Other rubberized piece goods and hospital sheetings.*sq. yd.*	213,574	77,638	1,374,428	482,653
Boots ....*prs.*	7,191	14,308	79,124	165,056
Shoes ....*prs.*	5,298	4,839	128,974	78,574
Canvas shoes with rubber soles ....*prs.*	46,320	35,188	352,499	281,947
Soles ....*doz. prs.*	2,437	4,390	27,846	53,341
Heels ....*doz. prs.*	20,838	10,273	166,787	96,327
Soling and top lift sheets..*lb.*	20,159	5,654	445,910	86,312
Gloves and mittens..*doz. prs.*	6,090	15,483	68,312	160,878
Water bottles and fountain syringes ....*no.*	26,595	8,206	180,251	60,519
Other druggists' sundries....	.....	67,573	.....	487,155
Gum rubber clothing....*doz.*	16,623	38,201	133,068	320,534
Balloons ....*gross*	24,133	18,996	135,234	116,938
Toys and balls....	.....	14,897	.....	82,088
Bathing caps....*doz.*	2,894	5,629	35,091	61,593
Bands ....*lb.*	8,969	3,898	129,983	61,955
Erasers ....*lb.*	10,201	4,765	159,948	91,475
Hard rubber goods				
Electrical battery boxes.*no.*	24,492	17,116	158,018	110,623
Other electrical....*lb.*	42,888	14,318	325,422	130,311
Combs, finished....*doz.*	23,140	14,073	137,909	76,672
Other hard rubber goods....	.....	10,617	.....	99,346
Tires				
Truck and bus casings.*no.*	58,090	1,345,199	256,959	5,463,810
Other auto casings....*no.*	33,640	385,515	324,172	3,550,612
Tubes, auto ....*no.*	74,751	177,597	429,926	837,676
Other casings and tubes..*no.*	7,724	49,612	61,361	478,164
Solid tires for automobiles and motor trucks....*no.*	92	3,037	3,216	64,869
Other solid tires....*lb.*	16,066	3,799	122,859	25,335
Tire sundries and repair materials ....*lb.*	158,076	45,405	1,619,859	454,688
Rubber and friction tape..*lb.*	43,143	11,857	488,258	135,360
Fan belts for automobiles..*lb.*	28,697	14,173	241,246	131,225
Other rubber and balata belts ....*lb.*	170,275	97,078	1,894,545	999,113
Garden hose ....*lb.*	68,112	12,668	515,319	93,915
Other hose and tubing....*lb.*	1,414,610	589,627	4,995,285	2,046,517
Packing ....*lb.*	116,322	52,096	841,230	406,003
Mats, matting, flooring, and tiling ....*lb.*	128,998	21,115	666,156	94,101
Thread ....*lb.*	8,862	7,985	520,579	366,830
Gutta percha manufactures..*lb.*	49,104	17,194	988,864	297,705
Latex (d.r.c.) and rubber sheets processed for further manufacture....*lb.*	72,166	65,539	795,713	220,012
Other rubber manufactures..	.....	137,072	.....	1,397,516
Totals	.....	$3,503,863	.....	$22,202,353